Dental

Abstracts

a selection of world dental literature

VOLUME 5 · NUMBER 4 · APRIL 1960

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Lon W. Morrey, D.D.S., editor
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AMERICAN DENTAL ASSOCIATION 222 E. SUPERIOR ST. CHICAGO 11

Published monthly by the American Dental Association at 1009 Sloan Street, Crawfordsville, Indiana. Entered as second class matter at the Post Office at Crawfordsville, Indiana, under the act of March 26, 1956. Change of address notices, undeliverable copies, orders for subscriptions, and other mail items are to be sent to editorial and executive offices, 222 East Superior Street, Chicago 11, Illinois. Printed in U.S.A. Subscription $8.00 a year in U.S.A.; $9.00 outside U.S.A. Single copy $1.00. Issue of April 1960, Vol. 5, No. 4. Copyright 1960 by the American Dental Association. All expressions of opinion and statements of supposed fact are those of the author of the abstracted article and are not to be regarded as expressing the views of the American Dental Association unless such opinions or statements have been adopted by the Association.

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3. To supply enough data in each abstract and digest that the reader may determine whether he wishes to refer to the original article for more complete information.

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General

A mouth-to-mask resuscitation device

Henry W. Seeler. *U.S.Armed Forces M.J.* 10:761-766 July 1959

An investigation completed under the auspices of the Army Chemical Center showed that mouth-to-mouth resuscitation produced lung ventilation rates far in excess of those obtained with manual resuscitation methods. The greatest obstacles to applying mouth-to-mouth resuscitation are the apprehension on the part of the operator to put his lips on the lips of the injured person and to receive the expelled breath on his face or even in his mouth, and the risk of dizziness of the operator after a short time of applying resuscitation. The dizziness is caused by hyperventilation from the operator's continuous deep breathing.

A simple, foolproof, mouth-to-mouth resuscitation device has been designed that overcomes the disadvantages of the mouth-to-mouth method. The control valve and associated tubing employ engineering and physiologic principles that direct the subject's exhalations away from the operator, and permit prolonged cyclic ventilation without exposing the operator to the effects of hyperventilation.

The diagram of the device is shown in Figure 1. The basic part of the system is a simple control valve (Fig. 1, center). This valve consists of three parts: a lower and an upper valve housing interposed by a formed or flat diaphragm. The parts can be joined together permanently, because no repairs will be necessary, especially if the diaphragm is of silicone rubber. The complete valve can be cleansed and sterilized repeatedly without taking the unit apart. A quadruple flapper, shown above the valve parts in the center of Figure 1, is inserted into a groove in the upper valve housing and serves as the inhalation valve for the operator.

Figure 1, left, shows the patient's inhalation phase. The operator inserts a hose providing a proper airway into the patient's trachea, positions the jaw forward and puts the mask on the patient's

Figure 1 Mouth-to-mask resuscitation device

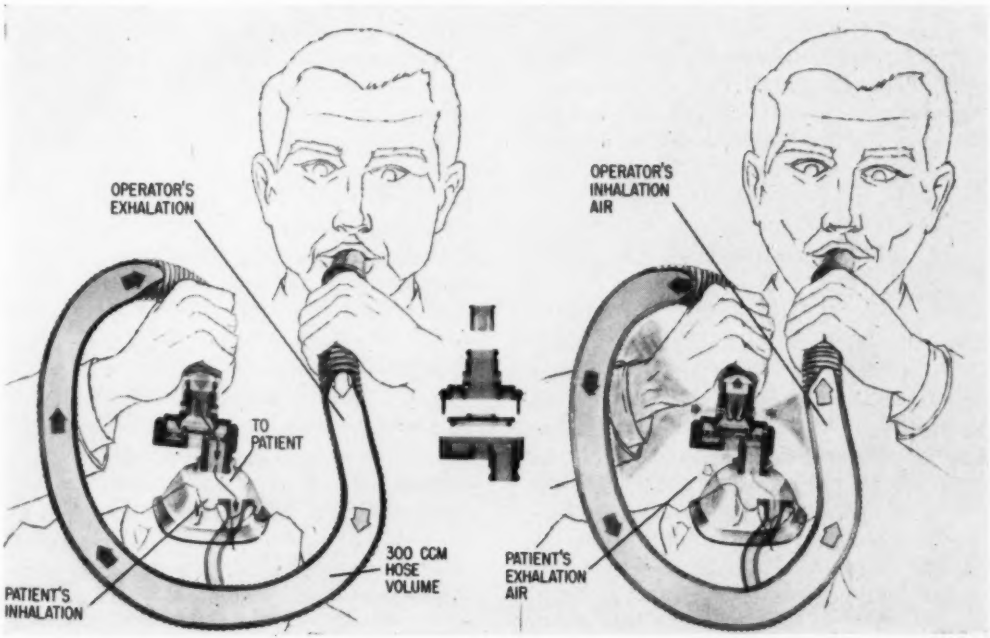

Figure 2 Demonstration of experimental mouth-to-mask resuscitation kit in use

face. The operator first blows through the hose 300 ml. of fresh air into the patient's lungs. While the operator is blowing air, the diaphragm moves away from the upper valve seat and allows the air to rush freely through multiple holes in the diaphragm through the lower valve housing and mask, into the patient's lungs. Simultaneously, the diaphragm will be pressed onto the lower valve housing seat which closes the exhalation port for the patient.

At the end of the operator's exhalation (Fig. 1, right), the air pressure in the hose drops to zero, and the higher air pressure in the patient and mask initiates the patient's exhalation phase and closes the upper valve seat. This action blocks the air flow back into the hose and, simultaneously, opens the lower valve and exhalation port to allow the patient to exhale freely. During the patient's exhalation, caused by the air pressure in his breathing system, the operator starts to inhale. He does not inhale through his nose, but through the mouthpiece, drawing the initial content of 300 ml. of his own previously exhaled air from the hose followed by fresh outside air that enters through four holes in the upper valve housing. These holes are normally closed by the quadruple elastic flappers. In the last part of the operator's inhalation phase, he inhales sufficient air into his lungs to replace the air in the hose with fresh air to be used by the patient during his inhalation phase. The inhalation-exhalation cycles can be repeated over a long period of resuscitation during which the operator never inhales the patient's exhalation air. The operator will not be apprehensive or subject to hyperventilation.

Figure 2 shows an experimental mouth-to-mouth resuscitator kit as it would be used on a person rescued from drowning. The kit consists of an airway hose with mouthpiece, the main breathing control valve, and the patient's mask. A mask-to-mask resuscitator kit for use in a contaminated atmosphere also has been developed.

Aero Medical Laboratory, Wright Air Development Center, Wright-Patterson Air Force Base, Ohio

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Survey of dental practice—1958

J.Canad.D.A. 25:634-639 Oct. 1959

The Canadian Dental Association in February 1959 mailed questionnaires to 5,698 Canadian dentists; 2,228 replies were included in the tabulation which follows. The figures in parentheses refer to the results of a similar survey conducted in 1953.

In 1958 the average independent dentist in Canada grossed $19,765 ($14,617) from his practice. He paid professional expenses of $8,505 ($6,708) and netted $10,453 ($7,541). Net incomes ranged from an average of $6,369 in Prince Edward Island to $11,855 in British Columbia. In 1953, the average net incomes of independent dentists ranged from a low of $5,816 in Quebec to $9,313 in Saskatchewan.

In 1958, 23.4 per cent (21.3 per cent) of Canada's dentists were located in cities with populations of 500,000 or more; 19.1 per cent (25.2 per cent) practiced in areas of 10,000 or less population.

When dentists were classified by age and income, it was noted that in 1958 the highest average net income, $12,167, was reported by independent dentists in the 30 to 34 year old age group, followed closely by the 45 to 49 year

old group and the 35 to 39 year old group. The variation in net income between ages 30 to 49 years was only about $500. From age 50 years there was a significant drop in net income. The dentist who graduated in the years 1949 to 1953 earned the highest net income during 1958, with graduates of the years 1944 to 1948 ranking second.

Since 1,914 independent dentists reported net incomes totaling $20,007,000, it is estimated that the 5,311 independent dentists in Canada netted $55,575,000 in 1958. By the same method, it is calculated that the total net income of all dentists in Canada in 1958 was $57,362,000. It is estimated that the 439 salaried dentists in 1958 had a total income of $3,283,000.

234 St. George Street, Toronto 5, Ontario, Canada

Severe injuries caused by camel bites

H. O'Connor. *Méd.tropic.* 18:74-83
Feb.-March 1959

K. Lorenz (1953) has called attention to the fact that when animals have facial expressions resembling those of man, people not familiar with the animals tend to attribute feelings and behavior to the beasts similar to their own. Nothing could be more erroneous and dangerous.

The supercilious, somewhat benign facial expression of the camel does not give warning of the severe wounds its bites can and do inflict.

Nine cases of camel bites, inflicted on North African natives, are reported, all but one resulting in compound fractures of bones in the craniofacial or maxillofacial region. The degree of crushing, tearing and forcible separation of tissue makes these wounds comparable to battle injuries from high explosives, and the same treatment methods are required. Like battle wounds, the injuries caused by camel bites are frequently septic and if neglected result in permanent disability.

The peculiar nature of camel bites is a consequence of the characteristic dentition of the camel. Among all ruminants, only camels and llamas have incisors in the upper jaw and canines in both jaws. These anterior teeth of the camel protrude from 3 to 3.5 cm. into the mouth, and overlap when the jaws are closed. The long and narrow structure of the camel's face permits a wide opening of the mouth and, therefore, taking a large bite.

Biting is mainly confined to the male camel which is especially vicious during the rutting period. The victims usually are native boys who are sent out to the pasture to catch the animals. A tether is affixed to the ring in the male camel's nose and hobbles are applied to his front legs.

The nose of the camel is extremely sensitive, and the insertion of the ring is a painful experience. When the "breaking" of the animal has been done in a brutal manner, the memory of the past injury to the nose tends to be activated whenever the camel is approached by a human being.

One of the cases reported demonstrates the severity of wounds caused by the bite of a male camel. A 15 year old native boy was seized by his head when he tried to apply hobbles to a camel stallion. A few hours later, the boy was brought to the colonial hospital with three deep wounds, 3, 5 and 16 cm. long. These injuries extended from the lobe of the left ear to the anterior part of the lower jaw. Probing revealed severe tissue destruction involving almost the entire maxillofacial region, especially the left external auditory meatus and the right parotid gland. The masseter muscle was severed near the zygomatic process of the upper jaw. Roentgenographic examination revealed the presence of fractures of the occiput and the mandible. A large mass of contused brain tissue was found beneath the occipital fracture. Despite these severe injuries, surgical repair was carried out immediately, and after 55 days, the patient had recovered satisfactorily, although there were some residual disabilities.

Severe wounds, caused by camel bites, have been recorded since ancient times. In the oases of the Sahara desert, preventive gelding and filing of the anterior teeth to about one fourth of the original length often are performed.

The camel may be regarded as the most important mode of transportation in North Africa, just as the automobile is in the civilized countries. There seems to be little difference between these two when it comes to grinding up human tissues, except for the fact that accidents caused by camels are rarer than those caused by cars.

Parc du Pharo, Marseilles 7, France

Prolonged use of iodine

J.A.M.A. 170:1363 July 11, 1959

Q.—Is there any likelihood of iodine toxicity in the following situation? For 30 years a patient has used, twice daily, a cotton swab saturated with a 0.5 per cent solution, in glycerine, of 7 per cent tincture of iodine to paint his gums after cleaning his teeth. He began this practice 30 years ago to cure a severe form of periodontal disease and has continued the treatment daily since that time. Except for slight acne, there are no symptoms.

A.—The greatest hazard associated with iodine and its compounds is acute poisoning from ingestion, injection or skin contact. Manifestations of chronic toxicity are relatively mild. Prolonged ingestion of iodine may lead to iodism in susceptible persons. Irritative phenomena develop in the skin and mucous membranes in the form of rashes and coryza, headache, conjunctivitis, laryngitis, bronchitis, stomatitis, parotitis and anorexia.

The cutaneous manifestations generally occur somewhat late. They may consist of acne, furuncles, erythema, purpura, urticaria and vesication, and these may be accompanied by fever. Since the patient has been using an iodine solution daily for 30 years and the only symptom is slight acne, it is apparent that he is not highly susceptible.

535 North Dearborn Street, Chicago 10, Ill.

Realism in maintaining the present population-dentist ratio in the next 17 years

B. Duane Moen. *J.Am.Col.Den.* 26:146-148 June 1959

Today the United States has 91,000 professionally active dentists serving a population of 174,000,000. There is one dentist for each 1,900 persons. How can this over-all ratio be maintained through 1975?

Whether that ratio will be a proper one in the future is debatable. Advances in preventive dentistry, improvements in equipment and technics, and increases in office productivity may combine to lower the number of dentists needed per unit of population. On the other hand, public appreciation and demand for dental care are increasing, along with increases in education and purchasing power. Programs for the group purchase of dental care may stimulate the demand for such care. Clearly, there are influences on both sides which well may prove to be counterbalancing.

In 1955 the Bureau of the Census issued four official population projections for future years up to 1975. Since 1955, population growth has exceeded the highest projection of 1955. The two highest 1955 projections indicate a 1975 population of 228.5 million and 221.5 million. In order to have a ratio of one dentist for each 1,900 persons in 1975, between 117,000 and 120,000 active dentists would be required, compared to 91,000 today.

In recent years, increases in number of dentists have not kept pace with population growth. The number of dental graduates in 1958 was about 3,100; about 2,100 dentists were lost through death and retirement, to provide a net gain of 1,000 dentists. However, the population increased about 2,900,000; in other words, only one dentist was added for each 2,900 persons added to the population. To have maintained the level of one dentist for 1,900 persons would have required a graduating class of 3,600 rather than 3,100.

If the population increases according to the highest projection, an increase of 125 dental school graduates each year will be required to have a ratio of 1,900 persons per dentist in 1975. This would require about two new dental schools to be established each year, or the equivalent in expansion of existing schools.

It is almost certain that the supply of dentists in relation to the population will continue to decline, and that per capita demand for dental care will continue to increase. How will the dental profession meet the added burden?

Dentists have been able in recent years to increase their productivity. The average annual number of patients treated by dentists has increased from 933 in 1949 to 1,012 in 1952 and to 1,056 in 1955. During this period there has been a sharp increase in the number of auxiliary personnel employed.

From 1953 to 1956 the average length of wait for the initial dental appointment of a series of appointments was reduced from 13.6 days to 12.8 days.

It appears that the productivity of the dental office is flexible. As demands on the individual dentist increase, he responds by hiring auxiliary personnel and by increasing office efficiency in other ways. This pattern undoubtedly will continue.

222 East Superior Street, Chicago 11, Ill.

Zinc-eugenol pastes: Contribution to the study of their setting time

Dioracy Fonterrada Vieira. *Rev.A.odont. Argentina* 47:145-156 May 1959

With few exceptions, earlier studies dealing with the factors capable of influencing the setting time of zinc-eugenol pastes did not yield precise findings on which to base any general rule for the handling of these materials. Tests were therefore made of five commercial pastes bought on the market—four from the United States and one of Argentine origin. To avoid confusion and repetition, the two known components of these pastes, that is, the zinc-oxide and resin base material and the liquid (eugenol and resin), are referred to as powder and liquid, respectively. Whatever other materials the pastes contain are trade secrets.

The tests were made in groups, each involving the variation of one factor only (temperature, proportion of powder to liquid, humidity, or mixing time). At least three trials were made in each group and the setting time was determined with the Vicat needle apparatus. The findings showed that the setting time, both initial and final, is less when (1) the quantity of powder used with a given amount of liquid is increased, (2) the mixing time is lengthened, and (3) the temperature is raised. The addition of water in very small quantities diminished the setting time of only two of the pastes studied; for the other three, the result was just the opposite. The absence of adhesiveness during the taking of the impression should not be interpreted as a signal to remove the impression, because adhesiveness disappears before the final setting. The initial setting time is highly important, because it indicates the moment after which the material should no longer be compressed. In general, the relation between the powder and the liquid has no great influence on the setting time; the influence of the other three factors—mixing time, temperature, and the addition of water—is much greater.

Specifications should be drawn up for zinc-eugenol pastes, so that their use can be standardized by means of technics based on predetermined properties. Dentists, for their part, should take into account all the details governing the preparation and use of these pastes in order to make the most of their special properties within a reasonable working time.

R. 7 de Abril No. 404, c. 113, São Paulo, Brazil

Odontalgia in deep-sea divers

H. Chenevee. *Rev.franç.odontostomat.* 5:1377-1384 Nov. 1959

Odontalgia in flyers has been reported frequently. Recent investigations carried out at the Dental School of the University of Paris have revealed that this specific toothache also occurs frequently in deep-sea divers (frogmen) swimming under water for extended periods mainly for military reconnaissance or demolition of underwater installations and in caisson workers in whom it appears as a part of the so-called caisson disease.

Water exerts a stronger pressure than air, and its traumatizing force increases at deeper sea levels. At a depth of 50 meters below the sea level, the human body has to withstand a total pressure of about 80,000 kg. Resistance to such an enormous pressure is possible only if the internal air pressure remains at approximately the same level. In deeper regions, the water pressure causes physiologic disturbances such as the formation of gas bubbles in the blood and odontalgia.

Of 1,000 frogmen examined, 60 experienced odontalgia of varying degree. The pain usually is localized in the pulp, and the effects sometimes are dangerous—even fatal—if carious lesions are present.

Before men are selected for deep-sea diving, a thorough dental examination is necessary. The dentist must have adequate experience to evaluate correctly the dangers frogmen are taking. In deep-sea diving, the same continuous dental care is necessary as already instituted in the air force.

One case report may serve as example for the occurrence of odontalgia in deep-sea divers. After

swimming for more than one hour at a level of 60 meters below the sea, the diver pulled the emergency cord. Brought to the surface, he suffered from a paralyzing shock. This frogman had previously dived into far deeper waters at least once daily for more than one month. His dental chart, recorded at the time of enlisting (six months prior to the incident), showed an excellent dentition, and his medical history did not reveal any systemic disease. On board ship, the diver exhibited pallor and clamminess of the facial skin, decreased blood pressure, feeble but rapid pulse, decreased respiration, and unconsciousness. After having received artificial respiration, he still showed restlessness, anxiety and odontalgia.

Dental examination, including full-mouth roentgenography, revealed the presence of an abscess located at one of the roots of the upper left second bicuspid. The tooth was extracted and the abscess surgically eliminated. The diver now appears to be free from odontalgia and the other associated symptoms even if he dives to far deeper levels.

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Telling patients the truth: a problem of professional ethics

E. Stransky. *CIBA Symp.* 7:12-15 April 1959

Beside the task of helping and healing and the obligation of secrecy, from which medical and dental practitioners bound by the Hippocratic tradition are released only in certain instances specified by law, the duty of telling the truth ranks high in the practitioner's code. The oath of secrecy and the obligation to tell the truth are closely connected. The position of confidence existing between the practitioner and his patient includes a guarantee that the physician or dentist will never reveal to a third person what he knows about his patient without the patient's consent. The patient, however, is entitled to expect from the physician or dentist "the truth, the whole truth and nothing but the truth" regarding his own condition.

Many physicians and dentists, surgeons in particular have invoked various motivations in support of the ethical principle never to withhold the truth from any patient, even from one whose condition is incurable, and certainly not from one who is "just" seriously ill.

Other professional men, however, have taken a very different view of the problem arising if the patient is known to be doomed. This school of thought, prompted by motives of humanity, advocates the telling of "white lies." Patients are liable to develop a phobia and, in instances of malignancy, to become carcinophobes. Provided no predisposition to carcinophobia exists, the practitioner should be perfectly capable, by using tact and tactics, of checking any phobia in the bud. Even a morbid fear of malignancy (which may be amenable to psychotherapy) is preferable to an incurable malignant tumor which may develop because the patient has not been told the truth and, therefore, neglected to undergo treatment.

The next ethical problem is as follows: if the practitioner, for one reason or another, has well-founded doubts as to whether to inform his patient about the diagnosed condition, should he make the situation plain to his patient's relatives or friends? The oath of secrecy precludes such a disclosure except with the expressed permission of the patient (assuming he is of age and in full possession of his mental powers).

In cases of emergency, the physician and, occasionally, the dentist, will choose what seems to be the lesser evil. Naturally, this implies a tremendous responsibility and with it the danger of being dragged to court. Can the practitioner be expected—in urgent instances—to respect the patient's refusal to permit him to inform third persons, such as the official authorities, about the prevailing condition? Obviously not, even at the risk of being prosecuted. Most judges will accord to the professional man who is responsible for diagnosis and treatment the benefit of doubt, and they will find in the judgment that he had acted in the higher sense of his professional ethics in all instances in which he was forced to take steps to prevent possible damage to a patient (which is, after all, the practitioner's primary obligation) without interpreting the oath of secrecy in too slavish a manner.

Municipal Neurological Institute "Rosenhügel," Vienna 13, Austria

Education

Out of the past and into the future

Roy G. Ellis. *J.Ontario D.A.* 36:6-9 Nov. 1959

On November 25, 1959, the new building of the Royal College of Dental Surgeons of the Province of Ontario was formally opened. Features of the building include closed circuit television; one clinic room equipped with 124 dental units (all with Airotors installed); ramps for patients as they proceed to any one of the seven clinical areas located on the ground floor and second floor; three lecture rooms, each with instrument panels on the podium for the control of two types of room lights, motorized screens and projection equipment; a library accommodating 120 readers; fluorescent lighting and acoustic tile on all ceilings.

Most of the fourth and all of the fifth floor are occupied with research quarters, with laboratories for almost all types of research in the biological sciences related to dentistry. There is a separate space for experimental isotope work.

In the clinical areas are two huge combination sterilizers which can be operated either by steam or gas (ethylene oxide); the latter is used to sterilize handpieces, endodontic instruments, and rubber gloves and other perishable equipment.

With closed circuit television, clinical or preclinical demonstrations can be seen by a whole class of 124 students. A dozen pickup points for programs are scattered throughout the building. The main televised programs originate in the television studio on the third floor, to be received in a 350 seat lecture room where more than one class can be accommodated at a time. Television as a teaching medium will not replace the conventional methods, but will serve as a useful adjunct.

Several features of the former building—including a stained glass window honoring J. Branston Willmott, one of the founders of the school in 1875—have been incorporated in the new building to preserve the traditions of the college.

Plans for a new building had been drawn up 15 years ago by a six man committee of the den-

The new dental school

Reception lobby for patients showing ramp to clinic

tal faculty. Several developments dictated extensive modification of the original plans and site; among them were development of graduate and postgraduate education, stimulated by financial assistance from the W. K. Kellogg Foundation during 1947-49; a recommendation by the Ontario government that 120 new dental graduates were required annually; the establishment of the Division of Dental Research in 1951, and inauguration of a school for dental hygienists in 1951, again with the aid of the Kellogg Foundation.

Early in 1955 a larger committee was established. Since 1956 the committee has held about 100 meetings to plan details of the new building.

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Report on the restoration of autonomy to the faculty of dentistry at Columbia University

Leuman M. Waugh. *Ann.Den.* 18:60-64 Sept. 1959

The School of Dentistry of Columbia University, New York City, was founded in 1915 in accordance with the rules prescribed by the Council on Dental Education of the American Dental Association and by the American Association of Dental Schools. For 30 years the dental school functioned on the basis of independence and autonomous administration. It was accorded a most generous budget by the University.

In February 1945 the Dean of the Faculty of Medicine of Columbia announced that the University trustees had canceled the autonomy of the dental school and made it a department of the Faculty of Medicine. He further announced that at a recent meeting of the Association of Medical Schools, from 12 to 15 deans of medical schools had expressed approval of the action of Columbia University and had stated that they would recommend such a change to their respective universities.

The dental faculty of the University defeated a resolution providing for nullification of the school's autonomy. Of 11 dental educators serving as professorial heads of divisions, only 3 favored the resolution and 8 opposed it. Opposition also was voiced by the late William J. Gies, who had made the survey of dental education for the Carnegie Foundation; by the New York Academy of Dentistry, and by the First and Second District Dental Societies of New York. Dental educators in the United States and Canada were greatly disturbed. In a short time the Council on Dental Education of the American Dental Association announced that the School of Dental and Oral Surgery of Columbia had been dropped from the list of accredited dental schools. This worked a hardship on the faculty and graduates. A number of division heads at the school resigned.

In the next 14 years, not a single university in the United States or Canada followed the example set by Columbia, and there were persistent rumblings of discontent in the school's dental staff.

In February 1959 the president of Columbia University announced that an independent faculty of dentistry would be established, effective July 1, 1959, and that Gilbert P. Smith, associate dean of the School of Dental and Oral Surgery, had been named dean of the new faculty by the University trustees.

Thus, the School of Dental and Oral Surgery has been restored to its original status as an independent, autonomously administered dental school headed by a dean who has earned the dental degree, and with representation on the University Council equal to that of all other faculties of the University.

The New York Academy of Dentistry has expressed its gratitude to Columbia University for restoring the independent status of the dental school and has reaffirmed its support of the school.

Betterton, Md.

Dental education in Latin America

Ernesto Cohn. *Zahnärztl.Welt & Reform* 60:362 June 25, 1959

In most Latin American countries, ten semester (five year) courses are required to graduate from a dental school associated with a university. Prerequisite for entering a dental school is the completion of a high school education. In Peru and Haiti, only eight semester (four year) courses are required to obtain a dental diploma.

Brazil has 30 dental schools associated with colleges or universities, the most important being the National Faculty of Odontology of the University of Brazil in Rio de Janeiro and the Faculty of Pharmacy and Dentistry of the University of São Paulo in São Paulo. In 24 of the Brazilian dental schools, only six semester (three year) courses in dentistry are required to obtain a dental diploma.

In Mexico, which has nine dental schools, eight semester (four year) courses are required to obtain a dental diploma, although the School of Dentistry of the University of Puebla requires ten semester (five year) courses.

The Faculty of Odontology of the University of San Carlos, the only dental school in Guatemala, requires 12 semester (six year) courses in dentistry to obtain a dental diploma and license.

A complete reform of dental education in all Latin American countries is planned, based on ten semester (five year) courses on basic medical and dental topics and completed by specialized studies in one of the branches of dentistry. It is hoped that this program will be accepted at the general session of the next Pan American Dental Congress.

In most Latin American countries, the dental faculties of the universities are independent from the medical faculties; in Brazil, however, dental education is, curiously, associated with pharmacological training.

The majority of dental schools in Latin America are federal schools; there are some private schools which usually are associated with a religious association, mainly with the Roman Catholic Church.

In most of the Latin American countries, dental education is available free of tuition charges; in others, for instance in Mexico, comparatively low tuition fees are charged.

The Faculty of Dentistry of the National University of Buenos Aires, Argentina, is the largest dental school in Latin America. The School of Dentistry of the Autonomic National University of Mexico in Mexico City is architecturally the most beautiful and most modern dental school.

Aptitude tests prior to entering a dental school are required by some of the Latin American dental faculties, especially by the Dental School of the University of Havana, Cuba.

However, only from 10 to 20 per cent of the enrolled dental students graduate in the Latin American countries.

All universities have student organizations in which dental students play an important part. Most of these student organizations are politically oriented, and student strikes occur frequently.

In all Latin American countries there is a lack of adequately trained dental educators, and in some dental schools physicians without dental training serve as members of the faculty. A systematic training for dental educators exists only in Argentina and Chile and the lack of scientifically trained teachers has produced a low standard in dental research.

With the successful example of dental education in the United States, it appears desirable to equal or even to surpass the curriculum of the North American dental schools. Recently, anatomy, physiologic chemistry, bacteriology, histology, embryology, pathology and biology were added to the curriculums of most Latin American dental schools. Public health dentistry, called "social dentistry," is the topic which gives the dental student the best possible preparation for the practice of dentistry as a public health service.

The dental schools as well as the dental associations in Latin America are opposed to overspecialization, although postgraduate training in endodontics, orthodontics, pedodontics, prosthodontics, oral surgery, operative dentistry, dental anesthesiology, dental roentgenography and practice management has been made available.

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Oral surgery

Correction of fistula of Stensen's duct by wire seton

James H. Erwin. *Surg.,Gynec. & Obst.* 109:247-248 Aug. 1959

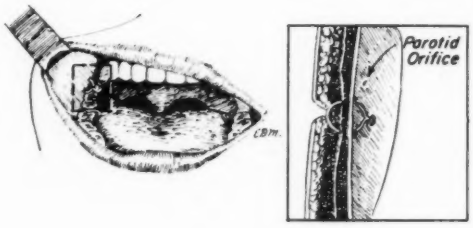
With the exception of paralysis of the facial nerve or one of its major branches, external salivary fistula is the most distressing nonlethal complication of surgical procedures in or near the parotid gland. Methods of treating parotid fistula, especially those originating from Stensen's duct, have been unsatisfactory. The successful use of a wire seton in the treatment of a parotid fistula was reported by Fishler and Pogorel (1955); the same simple procedure was effective in treating an external salivary fistula of the parotid gland in the patient whose case is reported here.

A man was admitted to the Mobile Infirmary with a facial ulcer of three years' duration after drainage of an abscess in that region. The ulceration had been recurrent. It would heal spontaneously and then break open and drain. The patient had been seen by a number of physicians and surgeons during the past three years, and on one occasion, because of the persistence of his complaints, he had been hospitalized in the State Mental Hospital.

On his right cheek was a partly epithelized ulcer 3 cm. wide, with a bed of pale granulation. In the center of the ulcer was an opening about 2 mm. in diameter. When the patient chewed gum or ate, saliva poured from this opening in drops and ran down the cheek. The other salivary ducts were patent. The right parotid duct was somewhat elevated and its opening was dry. A white, caseous material could be expressed with a tongue blade from the distal 1.5 cm. of that duct. No saliva could be forced through the duct; roentgenograms showed no evidence of stones in the duct.

Apparently, three years before admission, the parotid duct had been blocked by a stone or by some other debris. This caused salivary retention with secondary infection and abscess formation. The abscess was drained, and as a result of the drainage or the damage done by the abscess, subsequent attempts at local therapy and chronic inflammation had caused the ends of the salivary duct to separate widely.

The patient was operated on by using the technic described by Fishler and Pogorel. The entire region around the fistula and the ulcer was infiltrated with 1 per cent procaine hydrochloride. A U-shaped piece of no. 7 tonsil wire was inserted into the cheek so that the limbs of the wire straddled the external opening of the fistula. The two limbs then were passed completely through into the mouth so that they both appeared about 1.5 cm. from the old internal opening of the parotid duct. The ends of the wire then were twisted to prevent their slipping out. See diagram of wire seton in position.



The patient experienced no pain during this part of the procedure. He was given the standard dose of tetanus antitoxin and a broad-spectrum antibiotic, and was discharged. Within three weeks the swelling of the right cheek had subsided and the ulcer had healed so that there was a small loop of the wire protruding from the skin. The wire was tightened inside the mouth, and the course of antibiotics was repeated. He was seen in the office one month later, and the wire was cut and removed through the mouth.

The skin had completely healed, and since the insertion of the wire there had been no more external salivary drainage. During the next six months, the patient was seen on several occasions; at no time was he having any difficulty. On each occasion the new opening could be seen clearly and a free flow of saliva was present.

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End results in the combined (commando) operation for mouth cancer

H. Mason Morfit. *Surg.Gynec.& Obst.* 108:129-133 Feb. 1959

Cancer therapists realize that their treatments are based on the concept of removing the end result of a disease process, the precise nature of which is only dimly understood. Presumably, whatever metabolic aberrations are at work to produce the cancer in the first place remain unchanged by any extirpative procedure and are still at work after surgery or roentgenotherapy.

The combined "commando" type of operation for mouth cancer has won wider acceptance in recent years, at least partly because in the proper hands the mortality rate has been reduced to acceptable limits. The commando operation involves neck dissection combined with intraoral extension (usually jaw resection) designed to remove the primary tumor and regional lymphatics at one stage.

Cancer in the oral cavity occurs predominantly in men, is squamous or epidermoid in character in more than 90 per cent of all cases, has a strong predilection for cervical lymph node metastases and, even in treatment failures, distant metastases occur in only about one quarter of all patients. Death frequently occurs through failure to control the malignancy in the oral cavity and neck.

From 1948 to 1955, 58 commando operations for mouth cancer were carried out at the Bonfils Tumor Clinic in Denver. There were 30 treatment failures; 4 patients died as a direct result of the operation; in 19 patients, cancer recurred within one year after surgery; in 5 patients, cancer recurred in the second year, and in 2 patients cancer recurred in the third year.

There were 26 treatment successes, for an overall salvage rate of 46.6 per cent. In no patient who remained well for three years after treatment has cancer yet recurred in this series. There has been no postoperative death in the last 22 consecutive patients, and the operative mortality of the entire series to date has been reduced to less than 5 per cent.

Fistulas developed in 24 per cent of the patients, and healed by secondary intention in every instance. Some difficulty in swallowing has been encountered routinely during the first few postoperative weeks, but all patients recovered the ability to eat via normal channels.

Restoration has not been successful in patients with large mandibular defects. Dental prostheses, pins and bone grafts were used in a small group of patients, but the results were so unsatisfactory that they soon were abandoned. Unless the symphysis menti has to be sacrificed, a good esthetic result can be achieved. If the symphysis is sacrificed, as it must sometimes be for lesions of the anterior floor of the mouth, subsequent restoration is difficult and usually unsatisfactory.

Most patients have adjusted well to partial loss of the mandible. If they have teeth, they still are able to chew to some degree after the operation. If they are edentulous, it has not been possible to compensate for this deficiency, despite the ingenuity of the prosthodontist. Such patients must adjust to a soft, mechanically preground diet.

These results in mouth cancer demonstrate that a significant number of mouth cancers were "biologically predetermined" to be treated successfully. Results such as these do not support the concept that cancer is a disease whose course cannot be influenced favorably by the oral surgeon's efforts when it occurs in the oral cavity.

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Postoperative parotitis

H. G. Bach and D. Buttenberg. *München.med. Wschr.* 100:532-534 April 4, 1959

Although postoperative parotitis may occur after any surgical intervention, its etiology is unknown. Several authors have suggested that an infection originating in the oral cavity is the possible causative factor.

Most patients who have undergone surgery under anesthesia have an extremely dry mouth. In these patients the staphylococci predominate and the other constituents of the oral flora are suppressed. Infection spreading from a distant focus by way of the blood stream or the lymphatic system also can be considered as an etiologic factor.

Recently the neurotoxic autodigestive theory was put forward as an explanation for postopera-

tive parotitis. Vasodilatation, stasis, capillary permeability changes with localized hypoxia, necrosis and liberation of trypsin are usually listed as the causes; bacterial invasion, however, is of secondary character.

During the last ten years, 34 patients with postoperative parotitis were observed at the Clinic for Women's Diseases of the University of Heidelberg, Germany. The average age of patients was 45 years; the oldest was 74 and the youngest 18 years old. Bilateral postoperative parotitis occurred in 14 patients; unilateral postoperative parotitis in 20 patients (in 12 on the right side and in 8 on the left side). The peak incidence was observed on the fourth postoperative day and 25 patients contracted the disease within the first postoperative week. The average duration of the disease was six days. Parotitis phlegmonosa occurred in six patients.

Bacteriologic examinations revealed the presence of comparatively large numbers of the hemolytic *Staphylococcus pyogenes* var. *aureus* in most patients, and in one patient an accumulation of nonhemolytic staphylococci.

No relationship could be established between the primary disease, the type of operation and the occurrence of postoperative parotitis. The atropine and anesthetics, especially if used in endotracheal anesthesia, seem to contribute to the development of postoperative parotitis by depressing the normal secretion of the parotid gland. Statistically, however, these findings were not significant.

Treatment consisted of the following procedures: incision and drainage in two patients; administration of comparatively large doses of antibiotics or sulfonamides in 30 patients; roentgenotherapy in 14 patients, and physical therapy in all 34 patients. Roentgenotherapy (50 r for two successive days, irradiating an 8 x 10 cm. field) obtained the most gratifying results. In all instances in which roentgenotherapy was started at an early phase, the inflammation and swelling of the parotid glands and the pain disappeared rapidly. Eight of the 14 patients who had received this treatment were free of symptoms within three days, and the other six patients within one week. No other treatment method achieved such a quick regression of the symptoms.

In this series, three of the 34 patients died but in no instance was postoperative parotitis the cause of death.

Antibiotic therapy alone proved to be of limited curative value, but combined with roentgenotherapy postoperative and posttreatment infections could be prevented.

Universitäts Frauenklinik, Heidelberg, Germany

A histological evaluation of bone grafts made with cultured calf bone paste

Donald M. Seifert and Lennard T. Swanson. *Harvard D.Alumni Bul.* 19:121-128 Oct. 1959

Young female albino rats were anesthetized with ether, and rectangular bony defects were created on one side of the median suture of the skull with a dental bur revolving at slow speed. During cutting, the experimental site was bathed with physiologic saline solution. The cut rectangle of host bone, measuring about 5 by 7 mm., was lifted from the skull. No damage to brain tissue or to the blood vessels lying thereon was discernible. The graft site was irrigated with physiologic saline solution for the removal of bone particles.

The open defects were treated in one of four ways. A few sites were left open to determine the nature and amount of repair that would occur without the insertion of any graft material into the open defect. Others were filled with an autogenous graft, a homogenous graft, or with a cultured calf bone paste, available in sterile disposable plastic syringes from E. R. Squibb and Sons Company. The autogenous grafts were taken from the opposite side of the skull, washed in saline solution and then inserted into the implant site. The homogenous grafts were taken from another experimental animal of the same sex and weight. After insertion of the graft, the overlying soft tissues were approximated and sutured. The animals were sacrificed at intervals of two, four, six and eight weeks, and the implant sites were cut from the skulls and examined histologically.

In control animals in which the bony defect was left unfilled, the typical response was a bridging of the gap by a thin band of connective tissue which appeared to be collagenous, interspersed with small spindle-shaped cells. The new bone formed only a superficial covering on the

cut edge of cortical bone, and there was no significant bridging of the experimental defect at eight weeks.

The autogenous grafts showed a minimal amount of resorption after two weeks, and many osteocytes were present in the graft lacunae. The cut edges of both graft and of host bone had the least amount of appositional bone on their surfaces. The outer surface of the graft invariably was devoid of appositional bone. Where there was good approximation of graft with host bone, a bony union had taken place. In the six-week specimens, resorption and remodeling of the graft were plainly evident, and the new bone formation was proportionally greater than that found in the two week and four week specimens.

In the homogenous grafts, the bony union of the host and graft was similar to that of the autogenous grafts, and it was difficult to distinguish between the two.

The cultured calf bone paste incited an inflammatory response and was removed by osteoclastic activity without inducing any new bone formation on the part of the host. The bone paste was never incorporated into the appositional bone surrounding the cut edge of host bone adjacent to the defect. The findings suggest that the cultured bone paste is unsuitable as an implant for bridging defects in dermal bone.

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Surgical correction of hypertrophy of the masseter muscles

G. Ginestet, H. Frezieres and L. Merville. *Ann.chir.plast.* 4:187-195 Sept. 1959

Hypertrophy of the masseter muscles develops frequently in young persons and is caused by a unilateral overdevelopment of the masseter muscles.

The condition often is aggravated by the inability of the patient to masticate food because of missing or highly sensitive carious teeth. The masseter muscles tend to hypertrophy more on one side than the other.

In most of the patients a rounded cheek and facial contour is observed on one side and in some instances a concavity on the other side, especially if the unused muscles have partly atrophied.

In the young patient, exercise of the undeveloped or underdeveloped masseter muscle by use of electric stimulation is recommended, which gradually will restore the masticatory function and decrease the facial asymmetry.

In older patients, however, surgical correction of the benign unilateral or bilateral hypertrophy of the masseter muscles is required, usually by the endobuccal approach to the involved muscle. The resection affects the external or internal portions of the masseter muscles. When performed in accordance with this surgical technic, the intervention will not involve the roots or branches of the seventh cranial (facial) nerve, and if properly executed will decrease the development of postoperative scars.

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Hospital dental service

Dentistry at the Eastern Pennsylvania Psychiatric Institute

Eli Edelman. *Bul. Philadelphia Co.D.Soc.* 24:2:6-11 Nov. 1959

The alleviation of pain, infection and discomfort caused by dental disorders is an important factor in the recovery of mental patients. At the Eastern Pennsylvania Psychiatric Institute, a patient's first visit to the dental clinic ordinarily is for a routine dental examination, unless there exists an emergency condition. At the first visit a comprehensive oral examination is made, supplemented by a full mouth roentgenographic survey. The patient's behavior and cooperation are noted, and an estimate made of his probable amenability to dental treatment. After the proposed dental treatment is outlined on the patient's chart, the chart is forwarded to the patient's ward physician to acquaint him with the conditions found and to give him an opportunity to indicate whether the

patient is capable of undergoing the proposed treatment. The physician indicates the diagnosis of the condition for which the patient is hospitalized, and his estimate of the patient's probable length of stay in the hospital, together with other medical factors relevant to dental treatment.

Dental treatment must be related to the probable duration of the patient's hospitalization. Even though a patient is not particularly hostile, excited or disturbed, he may be indifferent to dental treatment, and become uncooperative when too much is attempted. The psychiatric patient often has an ego impoverishment to the extent that he has little interest in his health or appearance; therefore, he may lack the motivation that prompts the normal patient to undergo treatment. For these reasons, the patient should be evaluated carefully, and the treatment program may have to be modified.

After the patient has been admitted to the hospital, it is best to wait until he feels more at home before beginning dental treatment. When resistance to a phase of treatment is encountered, the dentist must evaluate it. If the patient has been cooperative in the past, the resistance may be caused by just a temporary mood, and it is best to dismiss the patient and reschedule him some days later; this gives the patient a sense of having some control over the carrying out of his own treatment. In a difficult patient, however, too ready postponement of treatment could encourage the patient to become more resistant on the assumption that his treatment would be dropped altogether. In such a situation, the dentist should be firm. In overcoming the patient's objections, the dentist must be careful of what he says or does. Care must be used in presenting the aspects of dental neglect, in order to prevent the patient from getting the idea that infection from his teeth is spreading through his body and from incorporating this concept into his delusional system.

The arousal of guilt in the patient also should be avoided, as this could set back and complicate psychiatric treatment.

With an apprehensive patient, the proposed treatment should not be outlined since this may prove overwhelming. Rather, it is better to take the particular element to be treated immediately, and focus on that.

To gain the patient's cooperation, the dentist's own manner is important. He should be interested in the patient, friendly but firm. Each patient must be appraised individually. For example, a patient suffering from catatonic rigidity may close his mouth, and it may take many minutes for him to reopen it. A mouth prop placed on the opposite side to that being treated will prevent these interruptions. If it is necessary to flush the operative site, the dentist should use the water syringe followed by the aspirator rather than attempt to have the patient expectorate. When treating a patient whose diagnosis indicates a paranoid condition, the dentist should avoid too much discussion. When treating a patient who is assaultive, the dentists should use the side or rear chair position so that he is not within the patient's striking range. Dangerous instruments and chemicals should be kept out of reach of the patient. Should the dentist have to leave the chair, the patient must be kept under observation by the assistant.

Many patients have bizarre ideas concerning outside agencies which control or direct their minds. An x-ray machine placed near the head of such a patient appears as a possible threat. With such a patient, the initial roentgenograms should be made of the lower anterior teeth. When the patient recognizes that nothing unfavorable happens, he may become adjusted to the situation and the entire series of roentgenograms may be taken.

If the patient refuses dental treatment, the cause of the refusal should, if possible, be determined. If it is fear of pain, this barrier often can be reduced by the use of a local anesthetic. If the cause is generalized apprehension, sedation may be tried.

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Fractures

The complex mandibular fracture

G. Kenneth Lewis and S. C. Perutsea. *Am.J.Surg.* 97:283-296 March 1959

The mandible is subject to frequent fracture because of its exposed position, powerful muscle attachments and lack of support. Mandibular fractures occur preponderantly in the middle years of life. Trauma is the primary etiologic factor. Sites of predilection of these fractures in order of frequency are the condyle, angle of the mandible, ramus, molar region, coronoid process, mental foramen, symphysis and alveolar process. In children, the site most subject to fracture is the cuspid region weakened by the unerupted cuspid. Large numbers of bilateral mandibular fractures show a break in the region of the mental foramen on one side, and at the angle of the mandible on the other. Because of the thinness of the mucosa and the fact that the roots of teeth are in the line of fracture, mandibular fractures usually are compound, and the bone protrudes into the mouth.

When the mandible is fractured, the pull of attached muscles in different directions tends to displace the fragments. Direction of this displacement depends on several factors, such as the site and angle of the fractured surface. Certain fractures may exhibit characteristic displacements which are of diagnostic value. The direction of displacement will depend on the muscles attached to the fragments. Fragments attached to elevator muscles tend to displace upward toward the origin of these muscles; those with only depressor muscles tend to displace downward toward the hyoid bone, and fragments attached to rotator muscles tend to displace inward and forward toward the pterygoid lamina. Fragments attached to two or more sets of muscles will tend to displace in the direction of the combined pull.

The degree of displacement is affected by the line of fracture, the presence of opposing teeth and the soft tissues around the fracture, particularly the periosteum; these factors limit the amount of displacement if no additional damage has occurred.

It is vitally important that reduction of the fractured mandible be accomplished as soon as the patient has recovered from shock, for the following reasons:

1. Failure to obtain the most accurate relationship of the teeth will result in serious interference with function.

2. Prompt reduction facilitates healing and reduces the tendency toward osteomyelitis by preventing seepage of saliva into the fracture line.

3. Practically all mandibular fractures are compound and the bone protrudes into the mouth.

4. Early reduction is imperative to minimize infection.

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Silver implant in situ fifty-one years after resection of mandible

Marsh Robinson. *J.A.M.A.* 171:890 Oct. 17, 1959

A dental roentgenogram taken during treatment of a 61 year old housewife revealed the presence of an angular fracture of a silver implant present in the left side of the mandible. She had no complaints. Her history revealed that at the age of 11 years she had developed an extraoral protuberance. Her family physician incised the protuberance, which yielded black blood. The wound healed, and she was referred to a Chicago surgeon, John B. Murphy, who removed the left side of the mandible and inserted a metal implant in 1908. The mandible had to be resected because "a giant cell sarcoma had attacked the angle of the right half of the mandible."

The patient experienced no difficulty with her resected jaw until about 1950. At that time a lower tooth was removed while she was under general anesthesia, and she thought the metal implant broke. This caused no difficulty except that she felt that her lower teeth did not occlude properly with the upper teeth.

A roentgenogram taken recently shows a fracture of the metal implant in the region of the mandibular angle.

3003 Santa Monica Boulevard, Santa Monica, Calif.

Roentgenology

How to modernize your x-ray machine

W. W. Wainwright. *Fort.Rev.Chicago D.Soc.* 38:12-15 Aug. 1, 1959

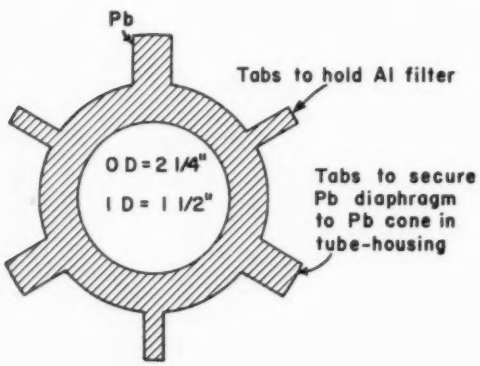
The most important safety features of the latest x-ray machines are the lead diaphragm and the aluminum filter. The dentist can install these safety features in his present x-ray unit, provided that its tube is completely shielded with metal.

The amount of aluminum to be added to filter the beam has been standardized at 1.5 mm.

A sheet of lead, 4 by 4 by ⅛ inch, may be obtained from a plumber, metal supplier or from a source known to the dental society. The lead sheet is cut as shown in the illustration, with an inside diameter of 1½ inches, an outside diameter of 2¼ inches, and six tabs, three of which will be used to secure the lead diaphragm to the lead cone in the tube housing, and three of which will hold the aluminum filter. The inside diameter of the lead diaphragm should provide a beam at the tip of the cone of 2¾ inches.

From an aluminum sheet, 4 by 4 inches by 1.5 mm. thick, a circle with a diameter of 2¼ inches is cut and placed in position. Dimensions may vary somewhat on different x-ray machines.

After the lead diaphragm and aluminum filter have been installed, the beam should be checked for centering, diameter and leakage. This may be done with a fluorescent screen or with the large-sized film used for extraoral views. If the beam is off-center without the diaphragm, a serviceman should be called to make the necessary correction.



Installation of the lead diaphragm and aluminum filter reduces the radiation to the patient and, if screens are not used, to the operator. The amount of reduction will vary, but in some instances will be 60 per cent. The primary factor in the reduction of radiation is the speed of the film used. For example, a change from slow-speed to ultra-fast film will reduce radiation exposure to patient and operator by more than 90 per cent.

Canoga Park, Calif.

Osteomyelitis of the mandible following irradiation: an experimental study

Elmer Ng, Frank W. Chambers, Jr., Harry S. Ogden, Granville C. Coggs and Jackson T. Crane.
Radiology 72:68-74 Jan. 1959

Osteomyelitis of the mandible after irradiation for treatment of oral cancer is likely to remain a recurrent problem as long as portions of the mandible lie within the field of irradiation. It has been believed that the likelihood of this complication is decreased by the preliminary extraction of any teeth that are diseased or lie within the region to be irradiated; but Quick and Patterson have advocated postponement of extraction, and Wildermuth and Cantril (1953) have suggested that extraction of teeth before irradiation predisposes osteomyelitis.

A series of experiments was undertaken to study this problem. In the first experiment, eight dogs received radiation to the right and left sides of the mandible every other day, three days a week, for 15 days. The total amount of radiation to each side ranged from 3,000 to 8,000 r, measured in air. In the two animals receiving 3,000 and 4,000 r, respectively, no osteomyelitis developed. In five dogs receiving 5,000 to 8,000 r, osteomyelitis in both mandibles developed.

The second experiment was designed to study the effect of extraction of the teeth prior to irradiation. The molars and premolars on the right side

of the mandible were extracted on an average of 16 days prior to irradiation. Both sides of the mandible subsequently were irradiated according to the schedule described in the first experiment. The one dog who received 3,000 r did not develop osteomyelitis in either side of the mandible. Of the remaining 13 dogs receiving from 4,000 to 8,000 r, osteomyelitis developed in the left (tooth-bearing) side of the mandible in every instance, but in the right side of the mandible osteomyelitis developed in only three instances.

The following conclusions were reached:

1. Gingival ulceration and osteomyelitis of the underlying mandible occurred after exposure to irradiation of 4,000 r (air) or more, under the conditions of this experiment.

2. Removal of the teeth prior to irradiation of the mandible significantly decreased the incidence of osteomyelitis.

3. Osteomyelitis was not observed in the absence of ulceration of the overlying gingiva.

4. Bone necrosis without osteomyelitis was not observed with the dosage and time range studied.

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Scatter radiation emanating from the patient during dental roentgenographic procedures

Duane W. Lovett. *J.D.Res.*
38:9-14 Jan.-Feb. 1959

An investigation was made to determine, by gross radiation detection equipment, the scatter radiation emanating from the patient during routine dental roentgenographic procedures. Four different dental x-ray units and two dental roentgenographic technics were used. The short film-target distance technic involved a skin-target distance of about 8 inches, the long film-target distance technic a skin-target distance of 17 inches. The clinical determination of scatter x-radiation emanating from the exposure of the patient to the direct beam of x-radiation was routinely performed in the same manner regardless of the x-ray unit being used.

The scatter x-radiation detected at a distance of 24 inches from the tissue varied with the two roentgenographic technics used. The short film-target distance technic yielded readings of 0.46 and 0.44 milliroentgen (mr) per exposure of four seconds. The long film-target distance technic yielded a reading of 0.24 mr per exposure of four seconds. At a distance of 30 inches from the tissue, the scatter x-radiation detected also varied with the two technics used. The short film-target distance technic yielded readings of 0.35 and 0.49 mr per exposure of four seconds, and the long film-target distance technic yielded readings of 0.17 and 0.09 mr per exposure.

Readings at distances of 54 inches and 72 inches indicated a decrease in the detection of scatter x-radiation as the distance between the source of the scatter x-radiation and the detection instrument is increased.

With the short skin-target distance, the area of coverage by the primary x-radiation at the patient tissue surface was a circle 4½ inches in diameter, or 15.90 square inches. With the long skin-target distance, the area of coverage was a circle 3 inches in diameter, or 7.07 square inches.

The decrease in detected x-radiation with the greater film-target distance and the smaller irradiated area is sufficient to indicate that this type of technic is advantageous in regard to scatter x-radiation.

Scatter x-radiation present during dental roentgenographic procedures is at a sufficiently high level to require protective measures by and for the operator.

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Roentgenographic examination of edentulous jaws

C. E. Crandell. *J.Pros.Den.* 9:552-554
July-Aug. 1959

A series of 100 average edentulous patients was selected at random. Upper and lower occlusal, upper and lower molar, and lower incisor roentgenograms were made for each patient. Other films were made to complete the roentgenographic diagnosis when indicated.

The patients ranged in age from 13 to 84 years. The mean age was 58 years and the median age, 59 years.

Fifty-nine pathologic conditions were noted in 36 patients. Forty root tips were found, of which

six were associated with radiolucent regions. Four foreign bodies were observed, as were five unerupted teeth, two impacted teeth, three cysts, one supernumerary tooth and a benign tumor.

The findings re-emphasize the indication for complete mouth roentgenograms of edentulous patients.

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Diagnostic and therapeutic x-radiation in an urban population

Abraham M. Lilienfeld. *Pub.Health Rep.* 74:29-35 Jan. 1959

During 1956, a probability sample of the adult, noninstitutionalized population of Buffalo, N.Y., was interviewed on the frequency of diagnostic roentgenographic examinations during a preceding 12 month period, and of roentgen therapy or radium treatment during a lifetime. The sampling fraction was 1 in 75, or 4,456 adults.

About 50 per cent of the adult population had had one or more diagnostic roentgenographic examinations during the 12 month period. Men had such examinations more frequently than women; for both sexes, the nonwhites had received examinations more frequently than the whites. Individuals of both sexes in the upper socioeconomic group received roentgenographic examinations more often than those in the lower group.

A large majority of roentgenographic examinations were of the chest; this is true for both races and both sexes. The next most frequent site of examination, for white men and white women, was the teeth (9.4 per cent of the men and 9.6 per cent of the women). Only 4.8 per cent of the nonwhite men and 3.7 per cent of the nonwhite women had had dental roentgenograms taken during the 12 month period.

About 8 per cent of the white population had received roentgen therapy or radium treatment during their lifetime, compared with 2.5 per cent of the nonwhite population. Women of both races had a higher frequency of such treatment than men. For both sexes of the white population, the upper socioeconomic group had received such treatments more frequently than the lower group.

The frequency of both roentgenographic examinations and therapeutic irradiation was higher among the Jewish members of the population than among the non-Jewish members. The distribution of roentgenographic examinations and therapeutic irradiation by religion and socioeconomic group was similar to the distribution of leukemia.

Studies are needed in other geographic areas to obtain more detailed information concerning exposure to therapeutic and diagnostic radiation.

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Possible relations between roentgenographic examinations during pregnancy and the incidence of leukemia and malignant tumors in the offspring

K. Gefferth. *Strahlentherapie* 108:107-115 March 1959

Forty-six case reports of children with leukemia or malignant tumors, treated at the Pediatric Clinic of the University of Budapest, Hungary, were investigated to determine whether a relationship exists between these conditions and diagnostic roentgenography during pregnancy.

The analysis of these case reports revealed that only two mothers had been roentgenographically examined (one for medical and one for dental purposes) during the second half of pregnancy.

In the control group, consisting of 346 children free of leukemia or malignant tumors, almost 30 per cent of the mothers had undergone roentgenographic examinations.

The possible effects of roentgenization on the fetuses must be considered to be of less significance as a cause of leukemia or malignant tumors than other, as yet not determined, factors.

Pediatric Clinic of the University of Budapest, Hungary

Anesthesia and analgesia

Local anaesthesia of the mandibular molar teeth—a new technique

J. Clarke and G. Holmes. *D.Practitioner* 10:36-38 Oct. 1959

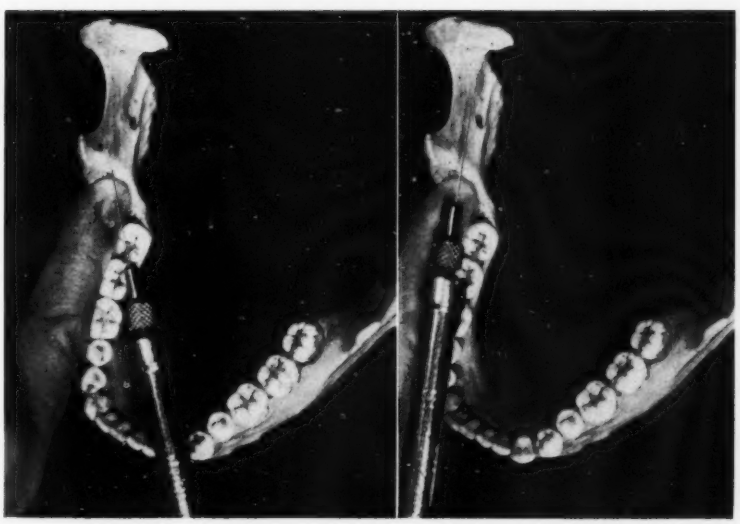
Lower molars often remain sensitive after an inferior dental nerve block. A new technic for anesthetizing the lower molars deposits the local anesthetic solution half an inch higher than the usual site.

Most technics for the inferior dental nerve block attempt to place the anesthetic fluid behind the mandibular foramen, which lies one finger's thickness above the occlusal plane of the molars. At this level, the anterior part of the nerve is concealed by the lingula and the sphenomandibular ligament. Local anesthetic so placed would diffuse less readily to these well-protected anterior fibers, and this suggests that the sensory fibers in the inferior dental nerve which supply the molars probably occupy the most anterior part of the nerve. According to Sicher (1946), the nerve from the third molar occasionally joins the main nerve trunk above the mandibular foramen, leaving the bone by its own foramen more anteriorly. Thus, in order to anesthetize this branch some anesthetic should be injected at a slightly higher level.

With the new modified indirect method, the patient is instructed to keep the mouth wide open. The headrest is adjusted so that the mandibular molar occlusal plane is parallel to the floor. The finger is slid along the molars in order to palpate the external oblique line of the mandible. The finger then is rotated toward the thumb side so that the tip of the finger now lies in the retromandibular fossa and the fingernail is superimposed on the internal oblique line.

The loaded syringe with a 1⅝ inch needle is grasped. Advanced from between the bicuspids on the opposite side (see illustration, left), the point of the needle is made to pierce the mucous membrane just above the fingernail and not at the mid-point of the fingernail as in previously used methods.

The internal oblique line now is encountered, and the syringe is moved gently around until the barrel of the syringe lies over the mandibular central incisors (illustration, right), at the same time keeping the barrel parallel to the molars in a horizontal plane.



Left: Position of the needle in the first position before injection is made

Right: Position of the needle at the site of injection

The needle is allowed to penetrate deeper, about another ¾ inch, and 1.5 cc. of the local anesthetic solution is slowly deposited. Thus, the injection will be made half an inch higher than the usual site, and in the vicinity of the nerve where it lies free of the bone. As the syringe is being withdrawn, the remainder of the anesthetic is slowly injected; this will anesthetize the lingual nerve.

To compare this technic with the standard procedure, a test was made in 40 healthy young adults who were divided into two equal groups. The patients in the experimental group received an injection of 1.5 cc. of anesthetic at the higher level. The 20 patients in the control group received the traditional inferior, dental, lingual and long buccal injections at the usual sites, each patient receiving 1.5 cc. of the same local anesthetic used in the experimental group. After an interval of five minutes the teeth were tested with an electrical pulp stimulator.

In the control group, in 14 patients the molars were anesthetized completely but in the remaining 6 patients, one or more molars remained sensitive to electrical stimulation.

In the experimental group, all molars were insensitive to the pulp tester.

In this small series, the higher injection was more effective in anesthetizing molars than was the standard inferior dental block. Furthermore, the impression gained was that the patients suffered less postoperative pain from this technic, possibly because the tissues into which the injection is made at the higher level are less tense than at the mandibular foramen.

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Electro-analgesia in operative dentistry

Guido Rauber. *Rev.A.odont.Argentina* 47:168-171 May 1959

The value of electro-analgesia was investigated in patients in whom the preparation of a cavity was possible only under anesthesia. In this investigation, an attempt was made to obtain the Suzuki effect; that is, analgesia by the closing of an electric circuit through the tooth. Microamperes were used, with the bur as the positive pole and the buccal mirror or a small bar of carbon, or both, as the negative pole. To avoid erroneous results due to suggestion, the patients were divided into three groups: those in Group 1 knew what was to be done; those in Group 2 were told what the procedure was to be, but, unknown to them, the circuit was not closed; and those in Group 3 had no knowledge of what was to be done. Analgesia was secured in 84.6 per cent of the Group 1 patients, and this percentage was not changed when the work was continued without an electric current. In Group 2, the percentage of those who reported analgesia was 62.5. In the third group, none of the patients admitted absence of pain and only one thought the intensity of the pain had been lessened.

Analysis and comparison of these findings lead to the conclusion that the analgesia secured was psychic in character; that is, it was a result of suggestion.

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Tranquilizing agents in dental practice

Donald A. Wallace. *Zahnärztl.Praxis* 10:105 May 1, 1959

The tranquility of the sedative drug field, long dominated by the various barbiturates, has been disturbed by the comparatively recent advent of the "tranquilizers," sometimes called "ataraxics."

These drugs are essentially sedatives, and after an attempt to classify them separately, the American Medical Association's Council on Drugs has listed them under the following headings: (1) central nervous system depressants, and (2) skeletal muscle relaxants.

These tranquilizing agents share certain unusual characteristics. They are somewhat more selective in their action and cause less drowsiness in therapeutic dosage than the barbiturates. Among those which seem most likely to have dental application now or in the future are the phenothiazines and the propanediol derivatives. Of these, chlorpromazine (Thorazine) and meprobamate (Miltown and Equanil) have been investigated.

Chlorpromazine is a powerful and versatile

drug. It has a wide spectrum of usefulness, and its dosage can be varied over a larger range than is possible or desirable with most sedatives. Chlorpromazine can be administered orally or parenterally, and its action is rapid. It has not only psychotherapeutic value—which has been widely publicized—it is a sedative and an antienemic, suppresses salivation, is effective against hiccough and it may potentiate the action of analgesics.

Unfortunately, chlorpromazine induces hypotension, and its effects are so numerous that some of them may be undesirable. These properties have undoubtedly discouraged dentists from using this drug preoperatively or postoperatively. Contact dermatitis and neurotoxic reactions have been reported. Obstructive jaundice occurred in about 1.5 per cent of patients after administration of chlorpromazine.

Meprobamate is a sedative and skeletal muscle relaxant. It is administered orally, and its full effect is attained rather slowly. Its dosage schedule (one 400 mg. tablet three or four times daily) should, therefore, be started the night before the dental appointment. Meprobamate has only a mild soporific effect, but it induces a calm and relaxed attitude in the patient. The drug does not necessarily impair function but it may interfere with the will to reaction, defensively or positively.

The sedative and skeletal-muscle-relaxant properties of meprobamate, however, combined with its relative lack of hypnotic effect, are advantages offered by hardly any other drug used in dental practice.

There are no definite contraindications to the administration of meprobamate and although serious side effects were reported, they were not common, consisting mainly of allergic skin reactions. Withdrawal symptoms may occur after an abrupt cessation of sustained meprobamate therapy. The sedative effect of a single dose lasts about five hours. The muscle relaxant effect, however, is shorter.

No discussion of the tranquilizing agents would be complete without mention of their cough-inhibiting property. Until recently, codeine was the cough suppressant of choice. This drug, however, is subject to the provisions of the Harrison Narcotic Act, and has specific disadvantages such as derangement of digestion and liability to addiction. Efforts have been made to find equally effective but nonnarcotic drugs for both the production of analgesia and sedation. Dextromethorphan (Romilar) hydrobromide, a synthetic morphine derivative, has been described as an antitussive agent in the recent edition of *New and Nonofficial Drugs*. It is not subject to the provisions of the Harrison Narcotic Act. Its toxicity is low and apparently is not liable to produce addiction. For use in dental practice, an adult dose of from 10 to 20 mg. once to four times daily is recommended. Dextromethorphan, however, is not an analgesic.

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Rectal thiopental in new dosage forms

S. N. Albert, E. E. Henley, C. A. Albert and H. N. Eccleston, Jr. *Anesth.& Analg.* 38:56-60 Jan.-Feb. 1959

Thiopental sodium was administered in two new rectal dosage forms to 554 children, ranging in age from 15 days to 12 years, who were undergoing surgical procedures, including dental surgery. In the first study, the dose of thiopental sodium used with each patient was a new, multidose suppository, with 1 Gm. of thiopental sodium for each 50 pounds of body weight. The multidose suppository is 5 cm. long; each centimeter contains 10 mg. of thiopental sodium, the dose for 10 pounds of body weight. Each suppository also contains a small amount of petroleum jelly and a sufficient quantity of cocoa butter to make a total weight of 2 Gm.

When a multidose suppository was to be administered, the appropriate length was measured and cut. The tip was lubricated with 2 per cent lidocaine hydrochloride jelly (any similar topical anesthetic jelly or ointment could have been used), and the suppository was inserted into the rectal pouch.

The first study involved 454 patients. Results were considered satisfactory when the patient fell asleep within 7 to 8 minutes but could be aroused with difficulty; results were considered fair when the patient was cooperative but only drowsy. Satisfactory results were obtained in 93.4 per cent; fair results, in 5.3 per cent; and no effects in 1.3 per cent.

In the second study, involving 100 children, the dose of thiopental sodium used also was 1 Gm. for each 50 pounds of body weight. However, disposable plastic syringes were used. Each syringe provided 1 or 2 mg. of thiopental sodium in the form of a suspension, graduated so as to indicate each 200 mg. or the dose for 10 pounds of body weight. Satisfactory results were obtained in 93 per cent; fair results, in 4 per cent, and no effects in 2 per cent. Hypersecretion and spasm occurred in 2 per cent of the patients, and excitement on induction also in 2 per cent. Recovery was uneventful in all but one patient, in whom overdosage resulted in depression. The recovery time for this patient was prolonged to 1 hour and 15 minutes.

Pharmacologic studies with rabbits showed that the vehicle in which the thiopental sodium was suspended was not irritating to the rectal mucosa and did not modify the effect of the active ingredient qualitatively, but only quantitatively.

The two new rectal dosage forms provide the flexibility of dosage offered by extemporaneously prepared water solutions, as well as the convenience of the suspension form; they deserve further study as means for the rectal administration not only of thiopental sodium but of other drugs for which presumably they would be suitable.

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A portable anaesthetic machine

J. D. K. Burton. *Lancet* No. 7104:650 Oct. 24, 1959

A lightweight, simple, versatile and economical anesthetic machine has been designed which weighs only 7 pounds and can be carried easily by hand. It holds up to 72 gallons of oxygen and 400 gallons of nitrous oxide. Made of standard components, the machine can—if the need arises—be connected to any available size of pin-index cylinder.

The machine is based on a combined regulator-flowmeter unit consisting of a cylinder yoke with nonreturn valve, an alloy pressure-reducing valve, a control tap and a plastic flowmeter with a rotating bobbin which can be observed easily from any direction. The stand consists of a central caster which can be folded to be carried in a bag or car. A tray can be fitted to the carrying handle when the apparatus is in use.

A regulator unit with a cylinder-contents gauge is used for oxygen; for nitrous oxide the regulator has a double yoke, allowing instant change from one cylinder to the reserve.

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The relative local anesthetic potencies of procaine, Orocaine, Kincaine and Xylocaine

Stanley C. Harris and Robert C. Worley. *J.D.Res.* 38:477-482 May-June 1959

The profundity, rate of onset, and duration of five local anesthetic preparations—2 per cent procaine hydrochloride plus 1:50,000 epinephrine, 2 per cent meprylcaine (Oracaine) hydrochloride plus 1:50,000 epinephrine, 2 per cent lidocaine (Xylocaine) hydrochloride plus 1:100,000 epinephrine, and 2 per cent isobucaine (Kincaine) hydrochloride plus 1:50,000 epinephrine and 2 per cent isobucaine hydrochloride plus 1:100,000 epinephrine—were compared in healthy dogs. All but the procaine solution also were assayed in human subjects.

The methods employed by Everett (1949), Worley (1954), Bjorn (1946) and Adilman (1954) to compare local anesthetics in dental situations in dogs appear to be sensitive and consistent.

Two per cent isobucaine with either 1:50,000 or 1:100,000 epinephrine, and 2 per cent lidocaine with 1:100,000 epinephrine elicit comparably profound and enduring local anesthesia.

Two per cent meprylcaine with 1:50,000 epinephrine and 2 per cent procaine with 1:50,000 epinephrine evoke anesthesia of briefer duration than that produced by the other three compounds tested.

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Extractions

Paresthesia: evaluation of 16 cases

Victor H. Frank.
J.Oral Surg.,Anesth. & Hosp.D.Serv.
17:6:27-33 Nov. 1959

In an effort to discover the frequency of occurrence of paresthesia and its duration, 300 extractions of lower third molars were surveyed. Only those teeth, practically all of them impacted, whose root apexes were 2 mm. or less from the mandibular canal, were included. Sixteen instances of paresthesia occurred. Of 48 teeth whose roots were 2 mm. from the mandibular canal, no paresthesia occurred after extraction. In 29 teeth in which the apexes were 1 mm. from the canal, there was one instance (3.4 per cent); in 183 teeth in which the apexes were on the canal, there were nine instances (4.9 per cent); in 40 teeth in which the apexes were below the canal, there were six instances (15.0 per cent) of paresthesia.

Of 14 patients with paresthesia whom it was possible to contact, only one recovered in less than one month. Four patients recovered in a one to three month period; six recovered in the three to six month period, and one in eight months. Paresthesia was still present in one patient after 21 months and in another patient after 18 months.

Of the 16 patients with paresthesia, 3 were men and 13 were women.

In the prevention of paresthesia, surgical care is of prime importance, particularly if roentgenograms show the mandibular canal to be in the same plane as or below the root canal. When cutting bone or sectioning teeth, the dentist should never apply force in a direct line with the canal. In sectioning teeth, he may direct force slightly from the buccal aspect.

Should lower third molars break, making it necessary to probe for roots, care should be taken not to force elevators or root instruments "blindly" in the direction of the canal. When forceps are used in instances in which the canal is lateral to the roots of the tooth, care should be taken not to rock the tooth laterally. Children should have their impacted third molars removed before the roots are fully formed. Meticulous records should be kept of instances of paresthesia. An exchange of information regarding the occurrence of paresthesia would be beneficial for the profession and the patients.

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Partial return of vision after extractions

D. C. Back. *Brit.D.J.* 107:49 Aug. 4 and 18, 1959

A middle-aged woman had partial use of the left eye only, being able to see light and dark, blurred shapes and moving masses. The right eyelid was closed and the right eyeball was laterally rotated. She had been in this condition for 20 years, after an accidentally self-inflicted blow with a rolling pin. A cataract and, later, iritis, had developed in the right eyeball, and the patient had been advised by several physicians and surgeons to have it removed.

After recent tooth extractions in the upper jaw from the cuspid to the third molar, the patient reported at her next visit that she had felt "severe twitchings" in her right eye, that her right eyeball had reverted to a central position, and that she could distinguish light from dark and even see firelight flickering.

The author did not test her report of the return of partial vision to the right eye, but it was obvious that the right eyelid had opened, whereas on previous visits it had been closed.

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Endodontics

Formation of new dentin in teeth with injured pulps

Josef Švejda. *Českoslov.stomat.* 59:175-180 May 1959

In healthy teeth of children and of young dogs, the experimentally exposed pulp was covered directly and completely with a capping consisting of the following compounds all chemically related to calcium: (1) calcium hydroxide; (2) magnesium hydroxide; (3) magnesium chloride, and (4) strontium bicarbonate.

In a control experiment, the capping consisted of filings from calf's bone.

After several months the teeth were examined histologically. The formation of an amorphous calcified layer on the cut pulp surface was observed. Occasionally, more frequently in the teeth of dogs than in those of children, dentin was formed on or near that amorphous calcified layer which formed the matrix for the dentin, resulting in a bridge covering the exposed pulp tissue. This dentin barrier was found more often in teeth capped with calcium hydroxide, but also in teeth capped with the other inorganic compounds. In teeth capped with calf's bone filings, however, the dentin barrier did not develop.

Inflammatory reactions which may be caused by the exposure of the pulp and by mechanical or chemical irritations progressed gradually until the pulp degenerated. The most extensive infiltration, however, developed in the teeth capped with magnesium hydroxide or magnesium chloride.

Almost in all instances, the pulp contained dentin spicules which can be considered as microtransplantations. These spicules became a calcifying center and were slowly absorbed without any participation of the blood vessels. Sometimes these dentin spicules remained enclosed in the calcified tissues.

Although these inorganic compounds damaged the pulp in varying degree, they stimulated the tissue to form new connective tissue and, occasionally, dentin. From the practical viewpoint, capping exposed pulps with these chemical compounds holds possibilities as an emergency treatment in instances where other methods have failed or are likely to fail. In these instances, either the root apexes are not completely formed or resorption has taken place. In most instances the inflammatory cells will disappear and healthy pulp cells, covered by newly formed dentin, will take their place, thereby providing a satisfactory healing of the injured pulp.

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Immediate canal filling without apical curettage

Lionel Metrick. *J.Canad.D.A.* 25:620-621 Oct. 1959

The practice of immediate root canal filling without apical curettage is not intended to replace or modify present endodontic methods that require medication and negative cultures. Rather, it is an auxiliary technic that may be used to save carious teeth with severe pulpitis.

Immediate root canal filling is indicated in instances where: (1) successful banding of the crown is questionable because caries has extended to the alveolar crestal bone; (2) no periapical involvement, such as swelling or putrescence, is present; (3) the initial toothache appears after about a week of mild intermittent discomfort, and (4) the roentgenogram confirms carious extension to pulp and bone, indicating reduced vitality.

The immediate root canal filling technic embraces (1) adequate local anesthesia, (2) extension of occlusal drilling to bring the canal orifices into view, (3) thorough filing to the root end(s), irrigating, drying and filling with silver point(s) and a canal cement, (4) restoration of the excavated tooth structure with amalgam, silicate or acrylic resin, and (5) in the event of postoperative discomfort, the application of heat to the area.

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Periodontics

Acceleration of gingival wound healing in nonepileptic patients receiving diphenylhydantoin sodium

Max Shapiro. *Parodontol.,Zürich* 13:56-61 July-Sept. 1959 [in English]

The use of diphenylhydantoin sodium for the treatment of seizures in epileptic patients has been frequently opposed by periodontists because severe edema of the gingivae often is associated with the administration of this drug.

Diphenylhydantoin sodium, however, has been used for over 20 years without causing severe toxic reactions.

Because it had been suggested that diphenylhydantoin sodium be administered to nonepileptic patients with periodontal disease to promote formation of new gingival tissue, the drug and its reaction on the gingivae of 33 nonepileptic, periodontal patients (experimental group) were studied. Nineteen patients (control group) received a placebo. A coded system (double blind test) was used.

After the patients had received either the drug or the placebo (both orally administered) for a period varying from one to eight weeks, a surgical wound was created by removing a section of the anterior gingiva, including a portion of the interdental papilla. The wound was covered with a protective pack.

One week later, a portion of the surface of the healing wound was removed together with the adjacent uncut crest. The specimens were fixed in Bouin's fluid for 30 minutes, washed in distilled water for 24 hours, sectioned in paraffin and stained with hematoxylin and eosin. The epithelial proliferation, fibroblastic activity, blood vessel proliferation, extent of coagulation and of inflammatory changes were studied.

In the experimental group, clinical findings revealed that all gingival wounds had healed uneventfully without evidence of granulation. In the control group, healing was delayed and in three patients granulation tissue was observed in some regions. After the protective packs were changed, less erythema and less pain were experienced by the experimental group than by the control group.

TABLE I Experimental group

				Duration (week)	*Epithelial proliferation*		*Connective tissue activity*			*Inflammatory reaction in wound*	
Patient	*Sex*	*Age*	*Area of section*	*Diphenyl-hydantoin sodium*	*Length fields*	*Thickness of cells*	*Organiz-ation of clot*	*Number fibroblasts*	*Number of blood vessels*	*Base area*	*Crest area*
1 E	♀	39	+ 12	1	***	6–8	**	**	**	**	***
6 E	♀	45	+ 21	5	*****	8–10	***	***	****	*	****
8 E	♀	36	− 12	3	****	10–12	****	****	****	*	**
10 E	♀	28	+ 21	1	***	5	***	***	***	*	**
			− 21	2	****	10–12	****	****	***	*	**
14 E	♂	52	+ 21	8	****	10–15	****	****	****	*	*
18 E	♀	40	+ 23	4	***	10–15	****	****	****	*	*
21 E	♂	21	− 32	2	***	8–10	***	***	***	*	***
		12	− 12	6	*****	10–15	****	****	****	*	**
23 E	♂	35	+ 21	4	***	10	***	****	***	*	****
			+ 12	6	****	10	****	****	****	*	**

TABLE II Control group

				Placebo							
1 C	♀	23	21 −	1	**	5–6	*	*	*	****	****
2 C	♀	45	21 +	1	****	4–6	**	**	**	***	****
5 C	♀	45	+ 12	6	*	5–6	*	*	*	****	****
11 C	♀	44	21 −	0	*	5–6	**	*	*	****	****
12 C	♂	30	− 12	8	*	5–6	**	*	*	****	****
17 C	♂	36	+ 12	3	*	5–6	**	**	*	***	****
18 C	♀	36	21 −	4	**	7	**	**	*	**	***
19 C	♀	38	− 12	5	*	5	*	*	*	***	***

Length fields: * = ½ microscopic field
Organization of clot: * very slight; ** moderate; *** advanced; **** well organized
Number of fibroblasts: * very few; ** few, or Number of blood vessels; *** moderate; **** abundant
Inflammatory reaction in wound: * very slight; ** slight; *** moderate; **** severe

The histologic findings are presented in the tables.

A pronounced acceleration in the healing of gingival wounds was observed in all patients of the experimental group as compared with the control group.

Systemic toxic reactions to diphenylhydantoin sodium (administered orally in doses varying from 0.1 Gm. to 0.3 Gm.) were few and minor. These reactions were transient and disappeared after reduction of the dose or temporary suspension of administration.

The mechanism of the action of diphenylhydantoin sodium in promoting rapid and undisturbed healing of gingival wounds is at present undetermined but is currently being investigated by the author and others.

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Dilantin gingival hyperplasia: newer concepts related to etiology and treatment

Lyon P. Strean and Eugene Leoni. *N.Y.State D.J.* 25:339-347 Oct. 1959

An interesting and peculiar reaction accompanying therapy with the antiepileptic drug, diphenylhydantoin sodium, is the development of gingival hyperplasia. Because of the edematous gingivae found in patients treated with this drug, an attempt was made to study the effect of two diuretic agents, chlorothiazide (Diuril) and acetazolamide (Diamox). It was hypothesized that the use of either of these agents would result in a loss of water from the edematous gingival tissue, thereby causing a reduction in gingival hypertrophy. Since acetazolamide produces metabolic acidosis because of inhibition of carbonic anhydrase, and chlorothiazide produces metabolic alkalosis because its effect on carbonic anhydrase is minimal, the pH of saliva of patients receiving these diuretic agents while receiving sodium diphenylhydantoin therapy was compared.

Sixty patients were divided into four groups of 15 patients each. The first group received diphenylhydantoin sodium, 0.3 Gm. daily; the second, diphenylhydantoin sodium 0.3 Gm. and chlorothiazide 1 Gm. daily; the third, diphenylhydantoin sodium 0.3 Gm. and acetazolamide 250 mg. daily; the fourth, no drug therapy.

The average pH of saliva in group 2 was 7.1, in group 3 it was 6.6; in group 1, 6.8, and in group 4, 6.8. Some patients had a salivary pH as low as 5.0 whereas in others the pH reached 8.0.

In another experiment, 50 patients received 0.5 Gm. chlorothiazide twice daily for three months. In class 1 were 10 patients with mild gingival hypertrophy and bleeding; in class 2, 28 patients with moderate gingival hypertrophy and bleeding; in class 3, 12 patients with severe gingival hyperplasia and bleeding.

Only patients with mild to moderate gingival edema responded to therapy. Complete reduction of the edematous regions was observed in some patients and incomplete in others, suggesting a loss of water from the hypertrophied gingival tissue. There also was some suggestion that epileptic seizures were reduced in frequency.

Another therapeutic agent, dexamethasone, newest and most potent of the corticosteroids that have been synthesized, was added to the therapy of those patients who responded favorably to chlorothiazide. Dexamethasone ointment 0.2 per cent was massaged into the involved gingival tissue for a period of two minutes, three times daily. Gingival inflammation was controlled within a few weeks. Of those in class 1, all ten patients recovered completely; in class 2, 12 recovered completely and 16 improved; in class 3, 5 improved slightly and 7 did not improve. The treatment was ineffective when the gingivae were overgrown and contained a large amount of dense collagenous fibers.

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Pedodontics

Measurements of the primary teeth

William S. Kramer and Ralph L. Ireland.
J.Den.Children 26:252-261 Sept. 1959

Although the authors of various texts on dental anatomy present a table of measurements for the deciduous teeth, in each instance this table refers to the original measurements as given by G. V. Black. Black's table has been the only guide for use by dental students, and only seven measurements are given for each tooth; these few measurements are inadequate for any scientific evaluation of the dimensions and morphology of the teeth, for they provide insufficient detail for discerning anatomical analysis.

In this investigation, some 45 measurements were made for each posterior tooth, and more than 1,600 posterior teeth were measured. Except where noted, measurements were made parallel with or at right angles to the long axis of the tooth; thus, it is possible for anyone utilizing these figures to apply them more accurately to anatomical study. Measurements were made with a Boley millimeter gauge. The results are presented tabularly, and in more graphic form by representing them on outline drawings of the upper and lower first and second molars. A statistical evaluation was made for each of the measurements of each of the anterior teeth, an upper molar and a lower molar, and the values obtained were analyzed.

Certain of the measurement averages obtained may be compared directly with those as given by Black. Considerable variations were noted. For instance, in the upper second molar, the over-all length given by Black exceeded by 1.3 mm. the measurement obtained in this study. The average for the mesiodistal diameter of the crown in this study exceeded Black's calibration by 0.8 mm. As to the length of the mesiobuccal root of the upper first molar, Black's average was greater by 1.2 mm. than the average obtained in this study. The remainder of the averages were relatively close.

In the lower first molar, the greatest variation with Black was found in the length of root; the average of this study proved to be 0.7 mm. greater for the mesiobuccal root, and the mesiodistal diameter of the crown was 0.57 mm greater in this study than in Black's table. In the lower second molar, the most noticeable disparity occurred in the over-all length; the average was 2 mm. shorter in this study than in Black's.

In this study, the average spread of the roots is indicated, a point previously not known and therefore in controversy among dental anatomists.

For the anterior teeth there was a close correlation between the averages found in this study and those advanced by Black.

The detailed measurements made for the posterior teeth, with particular reference to root form and spread, along with individual cusp position and height, should facilitate exactness in the anatomical reproduction of these teeth.

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Fluoride tablets

J.A.M.A. 171:1764 Nov. 21, 1959

Q.—Which fluoride tablets are satisfactory and safe for the purpose of controlling dental caries? What is the dosage schedule?

A.—The Council on Dental Therapeutics of the American Dental Association, in the April 1958 issue of *The Journal of the American Dental Association,* commented on the prescription use of dietary fluorides. Of the several forms of fluoride supplements on the market, the only one that has been brought into conformity with the Council's provisions is Fluoritab; additional products may be added to this list. The Council said in part:

"Fluoride tablets may be employed with least difficulty in localities where the drinking water is substantially devoid of fluoride. The following prescription illustrates their use:

"℞ Sodium fluoride tablets 2.2 mg. Dispense 100.

"Label: Use according to written directions.

"CAUTION: Store out of reach of children.

"Written directions should be provided according to the age of the child as follows:

"(1) Before two years of age. Add one fluoride tablet to each quart of water used for drinking purposes and for the preparation of formulas and other food.

"(2) From two to three years of age. Every other day add one fluoride tablet to an amount of fruit juice or drinking water which the child will consume at one time.

"(3) After three years of age. Administer one tablet each day in an amount of fruit juice or drinking water that will be consumed at one time."

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Clinical and etiological aspects of green stain

Norma J. Wells and Esther M. Wilkins.
J.Am.D.Hygienists' A. 33:184-188
Oct. 1959

Green stain appears as a coating on the enamel, and generally forms a narrow band gingivoincisally on the labial surface of the teeth, from which it may spread to the proximal surfaces. Green stain is found more often on the upper than on the lower teeth, and occurs more frequently in children than in adults. Springer (1944) found green stain on the teeth of 52 to 58 per cent of the children examined. The stain appears most often on the maxillary anterior permanent or deciduous teeth, less often on the mandibular anterior teeth, permanent or deciduous, and only rarely on the upper and lower posterior permanent teeth. When green stain occurs, it is usually found on pitted, grooved or striated tooth surfaces. The stain appears more commonly in children under 15 years old. Palmer (1897) asserted that recurrence of green stain depended on the patient's personal oral care procedures.

Although the composition of green stain has not been determined entirely, bacteria and molds have been found in the stain. Shay and others (1955) found that green stain contains 10 per cent calcium; from 1 to 10 per cent of phosphorus, sodium, silicon, magnesium and potassium, and less than 1 per cent of aluminum, iron, manganese, boron, copper, silver, titanium, nickel, barium and strontium.

The etiology of green stain is unknown. Green stain usually is found when gingival inflammation is present. The fact that blood tracers, iron and copper have been found in the inorganic analysis of green stain tends to support Miller's theory that hemorrhagic breakdown and sulfomethemoglobin formation leads to the formation of green stain. Because dental plaque, materia alba and films provide a means for retention of bacterial deposits, it is possible that these deposits enhance green stain formation. Ayres (1939) has suggested a relationship between green stain and vitamin deficiency. Springer (1944) and Leung (1950) found no relation between dental caries and green stain.

Good home care of the mouth should be emphasized to the patient. Removal of soft debris and mucinous or bacterial deposits which cause gingival irritation may reduce the possibility of green stain formation.

Green stain may be removed by a thorough oral prophylactic technic. A light scaling of the heavily stained areas may be helpful. Because the enamel may be decalcified beneath the stain, care must be exercised when scaling.

A cotton pellet saturated with iodine tincture and applied to the stained area prior to manual polishing may promote removal of the stain. Manual polishing of the surface with the porte polisher and wood point dipped in iodine tincture also aids in stain removal. A final polish is applied through manual and engine polishing. According to Hard (1957), rubber cup polishing should be done only after manual polishing.

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Natural head position, a basic consideration in the interpretation of cephalometric radiographs

Coenraad F. A. Moorrees and Martin R. Kean. *Human Biology* 16:213-234 June 1959

As early as 1860, craniologists realized that for cephalometric studies the skulls had to be oriented in a manner approximating the natural head position in the living patient.

The primary purpose of this study was to test the hypothesis that the natural head position in man is relatively constant. Confirmation of this assumption would introduce the possibility of utilizing an extracranial line of reference, the true vertical line, for orthodontic cephalometric studies.

Two groups of women students of the Forsyth School for Dental Hygienists, from 18 to 20 years old, had roentgenograms taken. The first group, consisting of 66 freshman students, was used in a pilot study in which the established natural head position was not changed. Two roentgenograms were made of each subject with a time lapse of one week.

Because differences in head position might be explained by an occasional tenseness of the subject resulting in an "unnatural" tilting of the head, the head position was observed prior to exposure in the second group, consisting of 61 members of the senior class. The head position was corrected, if necessary. Roentgenograms were made twice, again with a time lapse of one week.

The standard deviation of head position was 2.05 degrees in the first group, and 1.54 degrees in the second group.

The importance of the natural head position for the orthodontic interpretation of cephalograms can be demonstrated best by using the mesh diagram analysis. This method has the advantage of showing the findings in graphic form.

The line nasion-sella turcica is suitable for the orientation of mesh diagrams of the face. However, when the cranial base has an upward or downward deflection, it may be necessary to discard this variable intracranial reference line and to use instead the vertical line, as follows:

1. A line is drawn through the nasion parallel to the vertical line (line 1).

2. Two lines are drawn perpendicular to line 1, one through the nasion and one tangent to the lowest point on the border of the mandible (line 2 and line 3).

3. The distance between nasion and sella turcica is transferred on line 2 and divided into three parts.

4. The fourth line of the basic triangle is drawn parallel to line 1, but perpendicular to lines 2 and 3. It is drawn through a point on line 2 at a distance from the nasion which is three-fourths of the length of the distance between nasion and sella turcica.

5. The basic rectangle is divided vertically and horizontally into four parts, resulting in a mesh diagram of 16 rectangles which inscribes the face.

The tracings of the subjects indicated some of the possible variations in the relationship between two intracranial lines of reference. The Frankfort horizontal line is perpendicular to the vertical line. In the other intracranial line, the slope of the Frankfort horizontal line corresponds to the high inclination of the cranial base.

A significant discrepancy between the findings of the cephalometric analysis and clinical examination was caused by a pronounced downward inclination of the cranial base, a protrusion of the upper incisors was masked completely and the slight mandibular retrusion was exaggerated when the line nasion-sella turcica had been used in construction of the mesh diagram.

The procedure not only simplifies the technic of cephalometric roentgenography used in orthodontics but facilitates the interpretation of cephalograms for research purposes. It may provide a new approach to the study of facial asymmetry.

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Prosthetic dentistry

Improved phonetics in artificial denture construction

Leslie R. Allen. *U.S.Armed Forces M.J.* 10:1022-1033 Sept. 1959

In the Air Force, for obvious reasons, faulty speech cannot be tolerated when it concerns the flyer or control tower operator. An investigation was undertaken to develop a procedure in denture construction which would enable the patient to speak clearly after insertion of the denture.

Palatograms were made on a group of persons who had their natural teeth and normal speech. An analysis of the more than 500 palatograms made indicated that, although no two persons contacted exactly the same area in pronouncing a given consonant, sufficient similarity existed to constitute a pattern. The patterns for the t, d, n and l were not distinct, that is, it was not possible to look at a palatogram and determine which of these consonants had been pronounced in making the tracing; however, the pattern for these consonants as a group was distinct, so that it was possible to look at a palatogram and be certain that either a t, d, n or l had or had not been pronounced.

The pronunciation of the s and sh presented an individual similarity and constituted a distinct pattern. The pattern for the s begins about in the area of the lateral incisors and bilaterally includes most of the posterior alveolar area. The pattern for the sh begins about in the cuspid area, and bilaterally includes all the posterior alveolar area and some of the vault. The rugae area was contacted in some instances and not at all in others. In all palatograms, the entire posterior alveolar area always was contacted. The rugae area was involved only slightly in the pronunciation of the t, d, n and l.

The area in which thickness most distorts speech is the anterior alveolar area from cuspid to cuspid. An addition of 1 mm. thickness in this area made speech awkward and indistinct. An additional 1 mm. thickness in the posterior alveolar area made speech awkward but not indistinct. The entire vault area could be thickened up to the tongue-palatal tracing line without interfering with speech.

To develop a normal s and sh tongue-palatal pattern in the waxed maxillary trial base, usually it is necessary to thicken the area outlined by the palatogram. In most patients, it is also necessary to thicken the area of the incisive papilla to prevent the jet of air emitted by the median sulcus of the tongue from escaping toward the vault.

Building the tongue-palatal contact area to normal and thickening the area of the incisive papilla facilitates proper enunciation and eliminates much of the postinsertion practice period.

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Psychologic treatment of a patient with extreme nauseous reflexes

Ch. Böhne. *Zahnärztl.Praxis* 10:235-236 Oct. 15, 1959

A 64 year old patient always exhibited a persistent abnormal fear of introducing any foreign body into his mouth. Extreme difficulties were encountered, therefore, in taking impressions and inserting the indicated dentures.

Multiple tooth losses required the construction of upper and lower complete dentures. According to the patient, he had never worn his previously constructed lower partial denture and only occasionally the upper partial denture.

In his state of mind it was almost impossible to examine his mouth, extract the remaining teeth and to take impressions.

The patient was referred to a psychoanalyst to discover the cause of the phobia and to eliminate his anxiety and fear by psychotherapeutic procedures.

The patient was a very active person and a gourmet. His history revealed that he had undergone partial gastrectomy and suffered from cardiac disturbances.

After initial failure, the psychoanalyst resorted to hypnotic suggestions, which obtained a satisfactory result.

During the next appointment at the dental office, impression taking, multiple tooth extraction and insertion of complete dentures were achieved without difficulties after adequate premedication.

The patient now has worn his complete dentures for more than two years and offered no resistance when denture adjusting (relining) was required.

(13b) München-Gräfelfing, Germany

Pits on inner surfaces of cast gold crowns

Kamal Asgar and Floyd A. Peyton. *J.Pros.Den.* 9:448-456 May-June 1959

In a study to determine the causes of pits and voids on the inner surface of dental gold castings, more than 500 castings of full crown preparation on a bicuspid were made under different conditions. Factors considered included sprue gauge, sprue length and direction, single or double sprues, flaring of the sprue, pressure on the casting machine, and the amount of gold used.

The number of pits can be reduced or eliminated by increasing the casting pressure, the amount of gold and the sprue diameter (up to a certain point), and by employing proper sprue direction and length. Flaring of the sprue is as important as any of the factors just mentioned. However, it is a misconception to think that when the sprue is flared there will be no voids in the casting and that nonflared sprues always will produce pits on the casting. If a full crown pattern is cast with a high-heat technic, and if proper sprue gauge, length and direction are used, together with a sufficient quantity of well-melted gold, and if the casting machine is wound three or four turns, the probability of having pits is small, regardless of whether the sprue is flared. Flaring of the sprue becomes more important when hygroscopic and low-heat wax elimination technics are used and the casting machine is wound only three turns.

Extensive clinical experience in the clinic of the University of Michigan School of Dentistry supports the results of this study.

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An electromyographic study of face height in complete artificial denture subjects

James Lee Jensen. *Northwest.Univ.Bul.* 60:4:12-18 Fall 1959

A study was made to determine by means of electromyography and roentgenographic cephalometry any differences in the rest vertical dimension of the face before, shortly after, and from two to four months after the insertion of complete dentures. The subjects consisted of 12 edentulous patients chosen at random in the prosthetic department of Northwestern University.

The following conclusions are based on observations and statistical analyses of the data:

1. The variance between the rest vertical dimension of the face and the occlusal vertical dimension was of sufficient magnitude to impart reliability to the method.

2. The analysis of variance of the electronic integrator indications (which are a measure of the quantity of electrical activity given off by the masseter and temporal muscles while maintaining "rest" position) reveals no significant difference in the rest vertical dimension of the face whether the subjects are in or out of the cephalostat.

3. The variance obtained between the rest vertical dimensions of the face before the insertion of complete dentures, after wearing the dentures about one week, and after wearing the dentures two to four months was sufficiently small to indicate constancy of the rest vertical dimension.

4. More than half the subjects had complete dentures with a greater than average interocclusal clearance.

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Case reports

Unilateral peripheral facial paralysis in infectious mononucleosis

L. Amann. *München.med.Wschr.* 101:270-271 Feb. 13, 1959

Infectious mononucleosis probably is a disease of the reticuloendothelial system, caused by a specific virus. This explains the multiformity of its symptomatology, referred to by some authors as an "amazing masquerade," and by others as the disease's "protean nature."

The case history of a five year old boy showed that the neurologic manifestations of infectious mononucleosis may cause an erroneous diagnosis such as poliomyelitis.

Two days before the boy was hospitalized, his mother had observed that the angle of his mouth drooped. Severe perspiration occurred during the night, and on the following day swelling of the cervical lymph nodes was observed.

When the patient was examined by an otolaryngologist, poliomyelitis was diagnosed. At the time of hospital admission, the patient was reexamined, and it was found that all three branches of the seventh cranial (facial) nerve were paretic. There were no other neurological symptoms. Painful lymph nodes, the size of plum pits, could be palpated in the submandibular and submental regions as well as along the sternocleidomastoid muscles. The spleen was enlarged and tense, and the liver had slightly protruded beyond the costal arch. The temperature increased during the initial four days but then became normal. The sedimentation rate of the erythrocytes was accelerated, and the blood picture with an increased number of monocytic cells appeared to be pathognomonic for infectious mononucleosis. The weakly positive Hanganatziu-Deicher reaction, the presence of cervical lymphomas and of swellings in both the submandibular and the submental regions corroborated the diagnosis. Because there were no other indications of any different etiology, the peripheral facial paralysis must be ascribed to infectious mononucleosis.

There exists considerable evidence for neurologic manifestations of infectious disease in the literature, estimates of their incidence varying from 1 to 10 per cent. These neurologic phenomena may assume various forms such as simulating the symptoms of serous meningitis, meningoencephalitis, central or peripheral facial paralysis, sensory disturbances, convulsions, polyradiculitis, neuroses and other psychic or mental disorders.

Bilateral central or peripheral paralysis of the facial nerve has been observed in about 14 per cent of patients with infectious mononucleosis, but unilateral facial paralysis in only four patients.

The time of occurrence of these severe neurological disturbances may vary between the first and fortieth day after onset of the disease.

It can be assumed, however, that the routine treatment of patients with infectious mononucleosis by intramuscular injections of cortisone, corticotropin or any other steroid, promotes the development of severe neurologic or hematologic complications.

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Inflammation of the pulp, caused by secondary caries, simulating trigeminal neuralgia: report of case

Karl Heinz Löw. *Zahnärztl.Rundschau* 68:264-265 June 5, 1959

A 30 year old man, suffering from paroxysmal pain radiating from the right side of the lower jaw to the entire face, appeared at the Dental Clinic of the Rudolf Virchow Hospital in Berlin. The patient described the pain as of a lancinating nature occurring in attacks that lasted from a few seconds to several minutes. The right side of the lower jaw seemed to be the "trigger zone" which, if touched or moved, precipitated an attack.

He had consulted his dentist who referred him to a physician for treatment of trigeminal neuralgia. At first, the physician confirmed the suggested diagnosis, and initiated short-wave diathermy. The heating of the involved oral and

facial tissues, however, resulted in an increase in pain and shortening of the intervals between attacks. Finally, the physician referred the patient to the clinic.

Clinical examination revealed that the patient's lower, right incisors, cuspids and bicuspids were free of caries. The right, lower first molar had a proximal amalgam filling, the second molar a temporary filling, and the third molar a central amalgam filling. The gingiva showed a horizontal necrotic area, and in the region between the first and second molar the symptoms of marginal gingivitis were observable. In the other regions, the oral mucosa had an almost normal color and seemed to receive a sufficient blood supply. At the time of the clinical examination, the patient had a severe attack of pain, and stated that he had not eaten for the last two days because he feared that any masticatory movement would produce an increase in pain.

To alleviate, at least temporarily, the acute pain and the hypersensitivity localized along the mandibular division of the trigeminal nerve, 2 cc. of a 3.42 per cent procaine and caffeine solution (Impletol) were injected into the mental foramen. Relief from pain was obtained within a few minutes.

Roentgenographic examination revealed the presence of secondary caries of the third degree beneath the amalgam filling in the right, lower first molar. The cavity had extended to the entire lateral wall of the crown involving the still vital pulp. A deep gingival pocket, distal to the first molar, had developed, exposing the mesial root of the second molar.

Under regional nerve block anesthesia, both molars were extracted, and tampons inserted into the extraction wounds. Sanious pus was constantly discharging into the deep gingival pocket. A periodontal pack was placed in and over the pocket and kept there for three days, after which time the entire area was cleansed and disinfected. One week after treatment, the patient appeared free of symptoms and pain.

Although the etiology of trigeminal neuralgia is obscure, in the case reported, the patient suffered from a severe inflammation of the pulp, caused by secondary caries beneath the inadequately inserted fillings in the first and second lower right molars. As in trigeminal neuralgia, the pain appeared in attacks of a persistent throbbing type and of a neuralgic, lancinating character.

In all instances of trigeminal neuralgia with undetermined cause, pulpitis and secondary caries should be taken into consideration.

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Onychomycosis

Zahnärztl.Praxis 10:225 Oct. 1, 1959

Q.—The patient, a 39 year old dentist, has had onychomycosis for about ten years. Because the treatment, including extraction of the involved nails, has been unsuccessful, and the patient is hardly able to continue his dental practice, please give suggestions on prognosis and treatment.

A.—Onychomycosis (tinea unguium) is a type of fungus infection (*Epidermophyton floccosum* or certain species of *Trichophyton* and *Candida albicans*) which is most difficult to cure. The infected nails should be filed and pared down at regular intervals. Strong fungicidal liquids should be applied nightly. The patient should be cautioned that, even though he may strictly follow the instructions, there is still no great likelihood that the fungus infection can be eradicated completely. If a third avulsion of the involved nails is to be performed, the local treatment should be continued for at least several months prior to the surgical intervention. Postoperatively, the nail beds should be treated nightly with one of the strong fungicidal liquids to prevent reinfection. At the Dermatological Clinic of the University of Munich, application of a keratolytic substance (Keratolytikum Sagitta) produced improvement in from 70 to 80 per cent of patients with onychomycosis. Roentgenotherapy is of no help in the treatment of fungus infections of the nails.

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Histology

Resistance to lactic acid of teeth with mottled enamel

Gösta Gustafson and Pertev Ata.
Deut.Zahn Mund Kieferhk. 31:109-124
Aug.-Dec. 1959

Extracted teeth of residents of Isparta, Turkey, were investigated histologically to determine the degree of resistance to lactic acid.

The drinking water of Isparta contains 4.3 ppm fluorine, and the teeth examined showed a low incidence of caries but an extremely high prevalence of chronic endemic fluorosis.

After 14 teeth with mottled enamel and 14 healthy teeth had been subjected to the action of lactic acid for 2, 3, 4, 5 and 10 hours, the depth of the experimentally produced cavities was measured and the obtained data were compared.

The surfaces of the teeth with mottled enamel appeared less corroded by the action of lactic acid than were the surfaces of healthy teeth. The floor of the cavities in teeth with mottled enamel was filled with a fine powdery substance, which under roentgen-ray diffraction proved to be hydroxyapatite. This phenomenon did not occur in healthy teeth.

Histologic examinations demonstrated that various differences existed between the effect of lactic acid on the structures of teeth with mottled enamel and healthy teeth. Also in healthy teeth a great loss of substance, a dissolution of enamel and a precipitation of minerals occurred. The precipitation of minerals in the superficial layers was observable under polarized light as a pronounced increase in negative birefringence (Fig. A), and in microradiograms as an increase in radiopacity. Some of the structures beneath the superficial layers, however, appeared to be less influenced by the acid action.

Under similar conditions, the histologic examination of teeth with mottled enamel provided different findings. The experimentally produced cavities in these teeth were shallower although the lactic acid had penetrated the enamel below its superficial layers. In dark field illumination, the involved region appeared bright white (Fig. B), and under polarized light (Fig. C and D), a low degree of decalcification could be observed in the form of a change in the negative birefringence. Although lactic acid had penetrated along the prism sheaths as well as along the interprismatic substance (Fig. E), the minerals within the prisms were less dissolved at the periphery and not at all in the prism center. A preferential diminution existed along the Retzius' striae, but also in this area an extreme difference in the density of the less affected or unaffected enamel was demonstrable.

In the surface layers of the experimentally produced cavities, a dissolution of the enamel prisms had taken place which was less pronounced in teeth with mottled enamel than in healthy teeth. Necrotization of enamel prisms by the action of lactic acid occurred in different stages (Fig. F). Adjacent to the still unaffected enamel, the prisms appeared to be isolated and reduced in dimension (Fig. G), as observed under polarized light.

The results of the investigation indicated that the occlusal surfaces of teeth with mottled enamel were more resistant to the action of lactic acid than those of healthy teeth. In the experimentally produced carious processes, there existed also a significant difference in the pattern of attack. Although lactic acid apparently did permeate the surfaces of teeth with mottled enamel, there existed a strong resistance to decalcification of the inorganic parts of these teeth.

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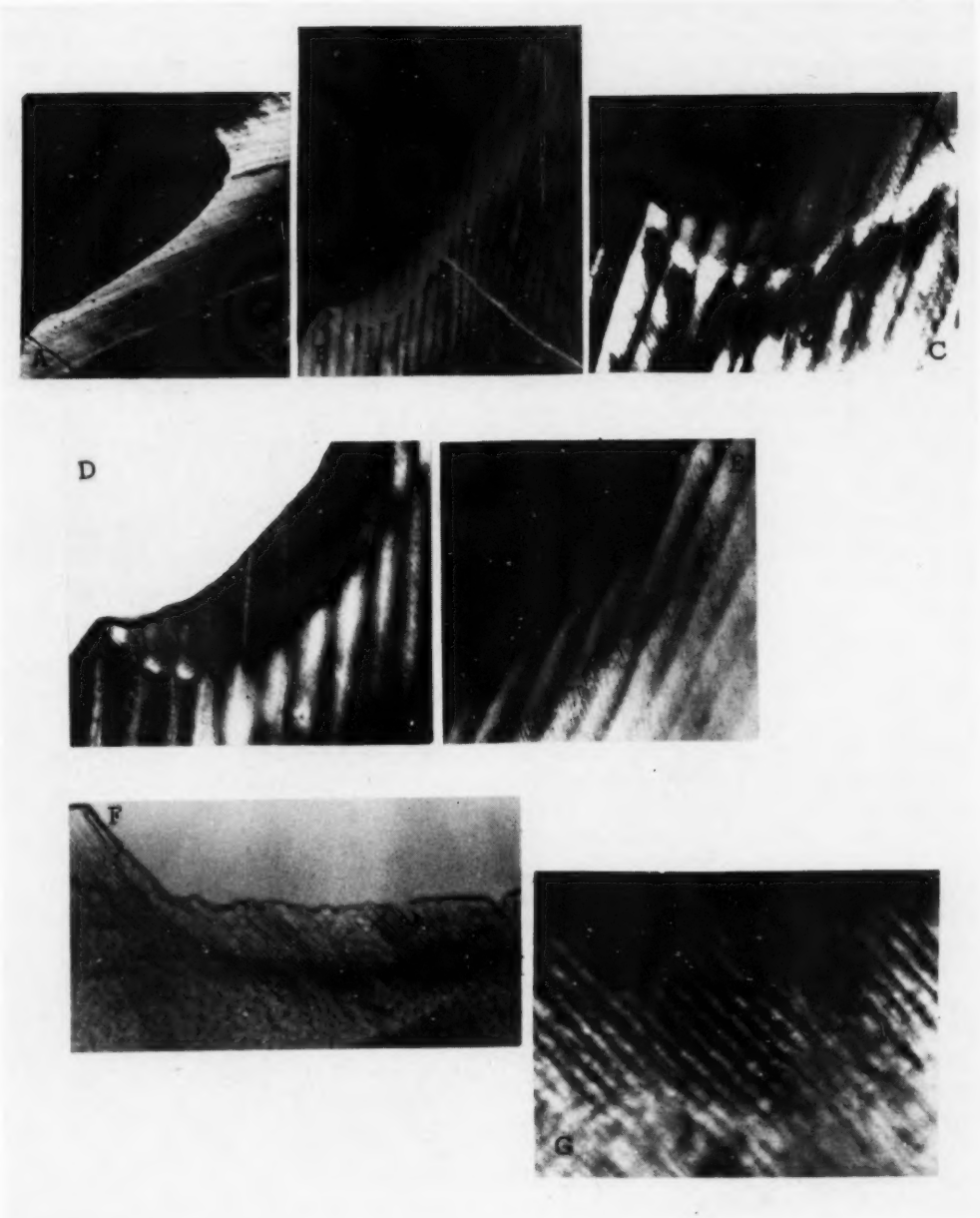
LEGENDS

A Occlusal surface of a tooth with mottled enamel after being subjected to the effects of lactic acid for 10 hours. Increase in negative birefringence

B Occlusal surface of a tooth with mottled enamel after being subjected to the effects of lactic acid for 5 hours. Dark field illumination

C The same surface as shown in B, exposed under polarized light



D The same surface showing a comparatively low degree of decalcification

E The same surface as shown in B, showing diminution of Retzius' striae

F Microradiogram of occlusal surface of a tooth with mottled enamel after being subjected to the effects of lactic acid for 10 hours. Secondary decalcification and necrotization

G The same surface exposed under polarized light

Defects in calcification of enamel during the intra-uterine and extra-uterine periods: prevention of postnatal caries by adequate nutrition

Helmut Vogel. *Deut.zahnärztl.Zschr.* 14:815-823 June 15, 1959

Successful prevention of postnatal caries requires cooperation between gynecologist, pediatrician, nutritionist and pedodontist.

Because the formation of enamel begins at the fourth month of intra-uterine life and proceeds to approximately the eleventh month of extra-uterine life, defects in calcification of the enamel layers formed during these two periods play an important part in the development of individual susceptibility to caries and, therefore, in the development of caries in deciduous teeth.

During the neonatal period, thin strata develop in enamel and dentin which in sections of deciduous teeth can be observed as distinct incremental lines, the neonatal lines. Histologic studies of these strata provide information of the quantitative and qualitative differences existing in the calcification of the hard tooth tissues.

The material studied consisted of longitudinal sections of 50 deciduous teeth (10 central incisors, 10 cuspids, 10 first and 20 second molars) of which 25 teeth were free of caries, and the other 25 were teeth which had had nonvital pulps and severe carious lesions. The first group came from children in excellent general condition, and the second group from children in rather poor nutritional condition. These specific tooth types were selected to enable a quantitative and qualitative evaluation of the calcification of enamel during the intra-uterine and extra-uterine periods.

In children in poor nutritional condition, whether or not caused by inadequate diet of the mothers prior to and during pregnancy, the enamel formed during the intra-uterine period showed defects in calcification whereas the calcification in enamel formed during extra-uterine period appeared normal. The development of caries susceptibility in these children, and the subsequent appearance of severe carious lesions in deciduous teeth soon after eruption, probably could have been prevented by an adequate diet of the mothers before and during pregnancy.

The calcification of the developing enamel was found to be a continuous assimilating process, and not divided into two periods (intra-uterine or extra-uterine). The author, therefore, suggests replacing the term "neonatal" lines by the more descriptive term "assimilation" lines, because these lines are not formed during the neonatal period but are present in enamel and dentin at the time of birth.

Hartenstein bei Zwickau, Germany

Early stages of dental calculus: a histological study

Ulrich K. Schneider and Hans R. Mühlemann. *Schweiz.Mschr.Zahnhk.* 69:755-765 Sept. 1959

In vivo calculus formation was studied at the Dental Institute of the University of Zurich, Switzerland. For from 1 to 60 days, 130 Mylar strips were fastened to the lower anterior teeth of 40 patients with a clinical history of rapid calculus formation.

After removal, the strips were fixed in Formalin, embedded in collodion, sectioned and stained with Gram's solution, Papanicolaou's stain, astrablue, mucicarmine, para-aminosalicylic acid (PAS), and Kossa's alizarin red stain.

The time required for the accumulation of calculus deposits varied in the different patients. The two or three day old calculus deposits consisted mainly of cocci; older deposits consisted of cocci and filaments.

A certain pattern in the formation and appearance of the two groups of microorganisms, however, could not be determined, with the possible exception that the very young plaques consisted only of cocci, filaments always being absent.

Calcification of the calculus deposits occurred within demonstrable colonies of cocci or, sometimes, of filaments. Two different types of calcification were observed: (1) the diffuse granular plaque calcification, and (2) the calcification by means of isolated compact centers consisting of granules. These centers were gram-negative and could be stained with astrablue, the microorganisms probably not being vital.

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Cancer quackery

Bernard E. Luck. *J.Michigan D.A.* 41:209-210, 213 July-Aug. 1959

Throughout recorded history until recent times, cancer has been such a terrifying scourge that many people have refused even to talk about it. The picture is brighter today; many types of cancer are curable if detected and treated early. But we in the health professions are prone to forget that many people do not know this. The stigma of cancer frightens them and they may lose their ability to think clearly. They turn their backs on the family physician and reliable hospitals, and grasp at straws. They throw themselves on the mercies of the unorthodox practitioner, the quack. These people are natural prey for cancer quacks. They are robbed of everything, the least important of which probably is their life savings.

The quack accepts patients with curable cancer and uses worthless drugs and remedies until the lesion becomes uncurable. This, in itself, tends to increase the public fear of cancer. On patients with late cancer, the quack often uses methods far less effective to control the disease and make life comfortable than are available by the use of orthodox methods. He exhausts the earnings and savings of those in limited circumstances without according any benefit.

The charlatan is found both inside and outside the medical profession. Usually, he can be recognized by a few characteristics. His treatment is available only from himself and usually is secret. It bears his name or that of a high-sounding pseudo-research organization. Usually it is advertised. The charlatan claims he is being persecuted by the "medical trust." His cured patients, and greatest supporters, have only his word that they ever had cancer in the first place. He discourages or refuses consultations with reputable practitioners, and his records are scanty or nonexistent.

The fringe of charlatanism may begin with the reputable professional practitioner who is misguided or uninformed on the cancer problem, who fails to recognize a lesion when he sees it or treats it with drugs and remedies which are inadequate. At the other end of the list are the vultures preying on the unsuspecting public, the quacks who are in business only to make a killing, which they do in both senses of the term.

As far as the patient is concerned, there are several causes of cancer quackery. The patient may be unaware of any difference between the cultist and the trained physician, the unorthodox clinic and the licensed clinic. The patient may fear the expense and may think it is less expensive to visit the quack. Or the patient may fear surgery and roentgenotherapy, and may consider cancer as uncurable. The most common single reason that a patient seeks the service of the unorthodox practitioner is that he becomes desperate and believes his physician has given up hope. The honest, intelligent family physician might know that a given case is inoperable and incurable, but he hesitates to keep on giving treatments that he knows will accomplish little good and will further drain the family finances. It is a mistake to convey to the patient and the family the feeling that there is little hope, that nothing more can be done. The charlatan is in business to make money, and he does so by offering hope. He is courteous, suave, optimistic and easily understood by the layman. The patient, having lost hope, is indifferent to the type of treatment used and whether or not it is fraudulent and administered by an unlicensed person. The orthodox physician has said, "I can do no more." The patient wants help. The orthodox physician should breathe faith and hope into such patients and guide them through the terminal period in such a way that the quack never obtains a foothold.

James L. Trawick, deputy director of the Food and Drug Administration, asserts that his agency should be provided with enough money and personnel to deal with the quacks who depend on interstate commerce in drugs and devices for their operations. State laws on medical practice and licensing should be strengthened. The public needs more education about the accomplishments of modern medicine. Many persons do not realize that the chances of cure in certain types of cancer

are as good as they are. Medical and dental societies must be prepared to investigate and take action against members of their own groups who stray into quackery, and must conduct educational programs for members of their profession as well as for the public.

As professional people, it is our duty to do everything possible to stop charlatanism, which results in unnecessary death, unwarranted mutilation, economic loss and mental anxiety. When we hear of a practicing charlatan, the fact should be reported to the state board of medical or dental examiners.

New laws and penalties may need to be drafted to deter premeditated quackery. This does not mean that well-meaning persons presenting anticancer agents shall be classified as charlatans. Every potential cancer cure should be examined carefully, no matter how unreasonable it may seem. Many known cures for disease have come from obscure research. However, it also is our duty to inform and protect the public from the menace of cancer charlatanism.

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Cancer of the tongue: general evaluation and principles of treatment

M. Dargent, M. Mayer and P. Bertoin.
Ann.chir.,Paris 13:135-146 June 1959

This report is limited to malignant epithelial tumors of the mobile portion of the tongue and includes only those neoplasms which originated in this portion but subsequently spread to other regions such as the floor of the mouth, the lateral portion of the lingual base or to the glossopalatine fossa.

The clinical material (580 malignant tumors of the tongue) was divided into three groups: (1) tumors of the first stage in which the neoplastic growth was less than 2 cm. in diameter (74 patients); (2) tumors of the second stage in which the neoplastic growth was more than 2 cm. in diameter but did not extend beyond the tongue (247 patients), and (3) tumors of the third stage in which the neoplastic growth involved more than two-thirds of the tongue and extended to adjacent tissues (259 patients).

Constant irritation from spicules of untreated carious teeth and from poorly fitting dental restorations played a greater role in the causation of cancer of the tongue than did smoking. The studies indicated a decrease in the incidence of lingual cancer in male patients after the age of 60 years without a decrease in habitual smoking, whereas in female patients the incidence of lingual cancer increased during and after this age period.

Although a general decrease in the incidence of lingual cancer has been observed in France, it may be ascribed to the decrease in the prevalence of syphilis, the improved care for general and dental health and the decrease in acute or chronic alcoholism.

Early recognition of cancerous or precancerous lesions of the tongue, by precocious diagnosis, is of the greatest value, especially in regard to lesions which developed less than one year before initial examination. After the initial period of about 12 months, lingual cancer assumes a slower rate of growth and, as a consequence, permits a more favorable prognosis.

The treatment methods have varied. Since 1940, there has been a tendency to combine radium therapy with roentgenotherapy and oral surgery in the form of complete enucleation of the tumor and systematic excision of the cervical lymph nodes. In 1942, an extensive surgical intervention was introduced consisting of removal of the involved and adjacent tissues whether or not they showed neoplastic growth. This method combined with radium-roentgen therapy obtained the best results (five year survival in 60 per cent).

Excluding certain treatment procedures which were merely of a palliative nature, four main treatment methods were employed: (1) surgery or electrosurgery, 79 patients; (2) insertion of radium needles, sometimes along with implantation of radioactive (radium-bearing) molds, 96 patients; (3) roentgenotherapy combined with insertion of radium needles, 184 patients, and (4) roentgenotherapy combined with insertion of radium needles and with surgical (electrosurgical) removal or immediate coagulation of the cicatrix (applied in instances with continued neoplastic growth and spread but not in instances of recurrence), 64 patients.

For each of these treatment methods three

series were distinguished: (1) primary tumors only, 241 patients; (2) malignant lesions requiring systematic removal of lymphatic tissue, 113 patients, and (3) primary tumors with evident or suspected invasion of the regional lymphatic system, 177 patients.

For these treatment methods, the results have not been fully evaluated except for the procedure resulting in a five-year survival in 60 per cent mentioned earlier. In particular, the results to be expected from the improved and more radical surgical interventions, from irradiation and from the combination of these methods require further study and evaluation.

The recurrence of malignant tumors of the tongue is at times difficult to distinguish from benign ulceration or necrosis caused by radiation. In such instances the further use of irradiation is contraindicated. If there is any evidence of failure of irradiation, surgical intervention should be attempted before the radiation doses applied are so high that they prevent the initiation of other treatment methods.

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Patients with oral cancer: must they die because they waited too long?

Kurt J. Odenheimer. *Deut.zahnärztl.Zschr.* 14:762-764 June 1, 1959

More than 20,000 patients with malignant oral tumors die every year in the United States alone. This is, the statisticians say reassuringly, only 10 per cent of the cancer mortality. For the patient, however, such a statistic does not ease his mind because he knows if death from cancer is his fate, he is involved 100 per cent.

What is the dentist's position in regard to the death rate? Is it absolutely necessary that so many people die from oral cancer?

Many patients believe that the diagnosis "oral cancer" is no less than a sentence of death. Carcinophobia frequently results in suicide or suicidal attempts. It seems absurd that many dentists and physicians share the hopelessness with the laymen, to wait for a possible "tomorrow" which will bring the one and only method to cure cancer. Does the "today" present not a single hope for successful cancer treatment?

Cancer research is not concerned with a single field or a single problem. It does not lend itself to concrete analysis or to definite classification along previously established lines. It can best be considered as a "campaign" rather than as an isolated "battle." But it has obtained some of the goals it has been striving for by including experimentation in the three basic sciences of biology, chemistry and physics. Cancer and its related conditions are results of the process of growth of living tissues. The problems of the origin, nature, development and control of cancer, therefore, are those which depend on the understanding of the process of growth, both normal and abnormal. The centers of growth, known as tumors, may show different degrees of disorganization and lack of control. Some, such as moles, warts and cysts, usually cease to grow even without treatment or intervention, and are called benign. Some of the neoplasms, however, continue to grow with unabated vigor and invade the surrounding tissues, and are called malignant. Because growth involves chemical reactions within the cells, chemistry plays a significant part in cancer research; because physical relations of and between structures within the cells must be orderly and organized to produce cell division, physics is clearly involved. Because the cell is an active, effective unit of the tissue, biology is involved.

An effort to find chemical substances which prevent, check or eliminate cancer by chemotherapy combining chemical and biologic methods has long been made in many laboratories, organized and extended under a specific research program. Roentgenotherapy, radiumization, irradiation with radioactive substances (isotopes), and last but not least, surgical enucleation of malignant tumors have been successful in many instances which—a short time ago—were incurable. Early detection and early treatment of malignant lesions in the oral cavity will result, in at least 50 per cent of instances, in an increased survival time.

To influence patients to observe precancerous lesions of the mouth, and to permit an early diagnosis, a missionary effort of dentists, physicians and teachers is required as well as education through radio and television, newspapers and magazines. Improved education of dental and medical students and practitioners should be de-

voted to the subject of cancer, cancer control and cancer awareness of the general public.

Earlier diagnosis of oral cancer and all related (precancerous) conditions, the establishment of clinics for cancer detection and cancer prevention, the organization of tumor clinics in every hospital and institution, and the passing of laws making every type of cancer a reportable disease are the prerequisites for successful cancer control.

Professional men as well as the lay public must recognize that the therapy of cancer begins with prophylaxis. The detection and discontinuance of cancer-inducing habits, the elimination of environmental hazards and of occupational predisposition to cancer, the treatment of all precancerous lesions and the removal of all benign tumors which are known to undergo malignant transformations, are effective steps in prevention of cancer and in decrease of the mortality rate.

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Cancer of the lips

James F. Smith. *J.Tennessee D.A.* 39:228-232 July 1959

A study of carcinoma of the lips at the University of Tennessee included 129 patients with this disease. Of the 129 patients, 12 were women and 117 were men. The average age was 57 years. Carcinoma of the upper lip was found in five patients, carcinoma of the lower lip in 124 patients. Eight of the patients were Negroes.

Of the 129 patients, 92 were tobacco smokers and 17 used snuff. Leukoplakia was noted in 24 patients. Leukoplakia of the lip always should be viewed with suspicion and a biopsy performed, since this lesion is found as a precursor lesion in many instances of carcinoma of the lip.

The chancre of syphilis may mimic carcinoma of the lip; however, a thorough history and serology examination, and the duration of the lesion, will serve to differentiate the two.

One of the 129 patients had blastomycosis involving the skin and lip. The symptoms of this lesion may be misleading, and the rare occurrence of the tubercular ulcer may present a temporary problem in diagnosis. Chronic fissures at the angles of the mouth, seen in patients with vitamin deficiencies and frequently in denture wearers, also may be difficult to diagnose. Nonmalignant tumors also may present diagnostic problems. A biopsy should be taken of any oral lesion of over two weeks' duration.

Carcinoma of the lower lip usually occurs on the vermilion surface equidistant from the midline and buccal commissure. Grossly, the lesion may in its beginning resemble a blister, scale or crust, but these forms usually develop into one of these three common growth patterns, the types being the exophytic, ulcerating and verrucose. The exophytic growth often will involve a large portion of the lower lip, with thickening and induration. The ulcerating type starts as an ulcer or fissure with induration surrounding the defect. The verrucose lesion has irregular surfaces with fissures and ulceration.

On microscopic examination, the great majority of malignant lip tumors are epidermoid carcinomas which demonstrate various stages of tissue changes such as hyperchromatism, nuclear fragmentation, increased mitosis, keratin pearls, bizarre sizes and shapes of epidermal cells, and dermal invasion of epidermal cellular components.

The present study showed 122 epidermoid carcinomas, 6 basal cell carcinomas, and 1 tumor of reticuloendothelial origin.

Well-planned radiotherapy is highly successful in early lip cancer, whereas other lesions may best be treated by surgical removal. The advantage of prophylactic neck dissection must be weighed with each patient. Of the 129 patients, 84 were treated surgically, 35 received radiation therapy, and 10 received both surgery and radiation.

One hundred and eight patients survived at least five years, nine died before five years and the remaining patients could not be traced. Metastasis occurred in eight patients after treatment.

The delay in time from onset to treatment was 19 months. Many patients did not seek early treatment because of a lack of symptoms or because of the benign appearance of the lesion.

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Biochemistry

Urinary fluorine levels in women during pregnancy and after delivery

Jtzhak Gedalia, Aron Brzezinski and Bruno Bercovici. *J.D.Res.* 38:548-551 May-June 1959

The urinary fluorine level of women at various stages of pregnancy was estimated in order to study the influence of the developing fetus on the fluorine metabolism of the mother.

Seven hundred and fifty-one urine samples obtained from 196 women during pregnancy and after delivery were analyzed for fluorine. All these women used the same water supply, which contained 0.5 to 0.6 ppm fluorine. The urinary fluorine levels decreased progressively up to the eighth month of pregnancy, indicating a retention of fluorine during this period. After pregnancy the urinary fluorine level did not return immediately to the usual adult value; a further investigation of fluorine metabolism of pregnant and lactating women is in progress to elucidate the factors involved.

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Fluoride content of human teeth from the Orient and the Canadian Arctic

James H. Shaw, Joan B. Resnick and Edward A. Sweeney. *J.D.Res.* 38:129-134 Jan.-Feb. 1959

Fluoride determinations were made on the enamel and dentin of teeth from 534 individuals from the United States, Pakistan, Iran, five areas of India, and five racial and cultural groups in the Canadian Arctic.

The results of the fluoride analyses, for enamel and dentin, respectively, were as follows: Teeth from individuals in Boston, 54 ppm and 86 ppm of fluoride; Iran, 267 ppm and 911 ppm; Delhi, 261 ppm and 730 ppm; average values for teeth of individuals from the other four areas of India, range of 108 to 190 ppm for enamel, and 278 to 589 ppm for dentin; Pakistan, 204 ppm and 627 ppm; Canada, same range as those of teeth from individuals in four areas of India, excluding Delhi. The levels of fluoride in the enamel and dentin of teeth of the coastal Eskimos who live on a primitive fish diet and of the Eskimos living near trading posts were significantly higher than those of the Arctic Indians on a civilized diet. All five of the Canadian Indian and Eskimo groups had levels of fluoride in the enamel and dentin of their teeth that were significantly higher than the fluoride levels of the teeth collected in Boston.

The average fluoride levels for the enamel and dentin of teeth from all individuals in all population groups but Boston were sufficiently high to give a pronounced resistance to caries if all other associated factors of oral environment, tooth structure and oral hygiene were equivalent.

These data suggest that in wide areas of the world where low dental caries susceptibility prevails, high levels of fluoride may be available during the formation of teeth in the inhabitants.

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Inhibition of human salivary and prostatic acid phosphatase and yeast enolase by low fluoride concentrations

Q. T. Smith, W. D. Armstrong and Leon Singer. *Proc.Soc.Exper.Biol.&Med.* 102:170-173 Oct. 1959

A study was made of the effects of low concentrations of fluorine on activity of salivary and human prostate acid phosphatase and yeast enolase.

Concentrations of fluorine or concentrations that could be derived from fluoridation of drinking water did not significantly alter enzymatic activity. The concentration of fluorine (2 to 3 ppm) required to cause significant inhibition was much above the 0.2 ppm found in body fluids.

The straight line relationship between the logarithms of low fluorine concentrations and logarithms of percentage of enzyme activity re-

maining suggested that it is possible to analyze fluorine content of pure aqueous solutions by degree of inhibition of activity of acid phosphatase of human prostate tissue.

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Acid and basic phosphatase activity in the human saliva of normal subjects and of subjects affected by dental caries, paradentitis and by excessive deposits of tartar

G. Giardino. *Panminerva Med.* 1:36-38 May 1959 [in English]

Experiments were designed to establish whether there is a relationship between salivary phosphatase, dental caries, periodontal disease and dental calculus. To determine the acid and basic phosphatase in saliva, the author adapted the method indicated by Fiske and Subba-Row (1925), modified by Shinowara and others (1942), for the determination of acid and basic phosphatase in serum. Samples of saliva were taken in a natural manner, with no mechanical stimulation, in the morning, from subjects with an empty stomach; the samples were tested at once for phosphatasic activity. Preliminary experiments were made on subjects with sound oral cavities. The values of phosphatasic activity supplied by saliva that had not been treated were found to be, for pH 5 and pH 10.9, respectively, 3.9 and 2.5 times higher than those relating to saliva that had been centrifuged.

From four groups of patients, each consisting of 24 men between the ages of 20 and 40 years, saliva was drawn and tested for acid and basic phosphatasic activity. The first group consisted of men with sound oral cavities; the second, with dental caries; the third, with periodontal disease, and the fourth group, of men whose teeth had abundant calculus deposits.

The results indicated that the acid phosphatasic activity of human saliva is far greater than the basic activity, which is often absent.

No substantial differences were found between the acid and basic phosphatasic activity of saliva from persons with sound oral cavities and from persons affected by dental caries.

The phosphatasic activity values of the saliva from persons with periodontal disease were considerably lower than those from persons having sound oral cavities. According to Tempestini and Messina, an increased alkaline phosphatase has been found in the serum of persons with periodontal disease.

In persons whose teeth have copious deposits of dental calculus, the average values of both acid and basic phosphatasic activity are somewhat higher than those in persons with sound oral cavities.

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Comparative analysis of saliva in pregnant and nonpregnant women: I. Calcium and pH

S. Leonard Rosenthal, Robert Rowen and A. J. Vazakas. *J.D.Res.* 38:883-887 Sept.-Oct. 1959

It has been suggested that teeth decay during pregnancy because of changes in the secretions in the mouth. Since pregnancy is accompanied by metabolic changes, caries during this period may be the result of a change in salivary composition and the ensuing modification of environment. To determine what changes, if any, occur in the salivary composition during pregnancy, a series of salivary analyses has been undertaken. This is a report of the first series—a determination of the calcium content and pH of saliva of a group of 61 pregnant women ranging in age from 14 to 38 years as compared to those of a group of 56 nonpregnant women ranging in age from 17 to 27 years.

There appeared to be no statistical difference in the calcium content of the saliva between nonpregnant women and pregnant women, the mean concentrations being 5.3 mg. per hundred milliliters and 5.2 mg. per hundred milliliters, respectively.

A significant difference, however, appeared in the pH values found in the saliva of the two groups. The mean pH value for the saliva of nonpregnant women was 7.0; that for the saliva of pregnant women, 6.5.

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Pathology

Exanthematous necrosis of the jaw and gangrenous stomatitis in the differential diagnosis

Wolfgang Bethmann.
Deut.zahnärztl.Zschr. 14:295-298 Feb. 1, 1959

In tropical Indochina, I had the opportunity to observe and to treat about 60 patients with exanthematous necrosis of the jaw, gangrenous stomatitis (noma) or with both diseases combined.

In exanthematous necrosis of the jaw, usually occurring after measles, dyspepsia and circulatory diseases, a specific irritation of the periosteum, resulting in chronic periostitis, becomes associated with new formation of osseous tissue. The old bone, deprived of nutrition, becomes necrotic. The presence of infection from carious teeth or gingival inflammation causes severe osteomyelitis with sequestration of parts of the bone or the entire bone, which gradually becomes surrounded by a new involucrum.

In gangrenous stomatitis, usually occurring in debilitated persons, the pathologic changes start on the buccal mucosa, especially the buccogingival fold or the mucous membrane around the third molar. The disease may be promoted by tooth extractions, especially of partly erupted third molars. At first a small ulceration is observed from which a gangrenous decomposition spreads, rapidly involving the surrounding oral tissues. Flooding of the ulcerative lesion with saliva, especially if the duct of the parotid gland is involved, seems to play an important part in the rapid progress of the disease. The inner cheek is edematous, bluish-gray in color, and causes extreme pain. Large parts of the jaw become necrotic, resulting in perforation and exposure of the bone. Grangrenous stomatitis, but not exanthematous necrosis, is always associated with an extremely strong, hardly bearable, halitosis.

Although both diseases show some similar symptoms such as multiple tooth loss, secondary infection and septicemia of the lungs, the differential diagnosis is not too difficult. The mortality in gangrenous stomatitis is comparatively high, although not as high as stated in most textbooks (80 per cent). In our series the mortality was 30 per cent. Only one patient with exanthematous necrosis of the jaw died.

In uncomplicated instances of exanthematous necrosis, rest and cold applications to the injured parts generally are sufficient to obtain improvement. In more severe instances, drainage should be established by surgical incision, and foreign bodies, if present, should be removed.

In gangrenous stomatitis, treatment consists of intramuscular injection of 10,000 units of penicillin given every four hours until the total dose of 250,000 units has been administered. Irrigation with a buffered aqueous solution of sodium hypochlorite (Dakin's fluid) extraorally and with a weak hydrogen peroxide solution intraorally has palliative effect. Early surgical intervention by means of endothermy or electrocoagulation is recommended.

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Diabetes mellitus in dental practice

Werner Hägler. *Schweiz.Mschr.Zahnhk.* 69:1-21 Jan. 1959

Recently, the oral manifestations and the dental aspects of diabetes mellitus have stimulated the interest of the dental profession in this disease.

Dental procedures for diabetic patients require special considerations as to management, anesthesia and prevention of complications. Prior to any dental procedure, the dentist must ascertain whether the disease is adequately controlled and whether the patient has eaten any food containing carbohydrates during the last three hours.

The treatment of each diabetic patient depends on the severity of the disease and its degree of control.

Infection in the mouth of a diabetic patient should not be tolerated. Before any oral surgical intervention, the patient's metabolism must be equilibrated by his physician.

Apart from the classical signs of diabetes mel-

litus, there is often sufficient evidence of an undiscovered diabetes to be found in the oral cavity (such as periodontal disturbances and excessive carious lesions) that the dentist will suspect the presence of the disease. These oral manifestations occasionally are the first symptoms of diabetes. Their cause may be the increased carbohydrate content of the saliva which results from diffusion of the high sugar content of the blood. If sudden onset of rapidly developing caries occurs in an adult who previously was resistant to caries, diabetes mellitus should be suspected.

Postoperative complications are effectively prevented or at least minimized by immediate hospitalization and careful attention to individual stress reactions.

Each diabetic patient requires specific management, and the success of dental treatment often depends on the preoperative and postoperative care given by the dentist.

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The oral tissues in vitiligo

Clifton O. Dummett. *Oral Surg.,Oral Med. & Oral Path.* 12:1073-1079 Sept. 1959

One of the most interesting dermatologic pathoses is vitiligo, an acquired, slowly progressive loss of cutaneous pigment. The oral manifestations have not been described in dental literature.

The three cases reported involve American Negro men. It has been asserted that vitiligo is found more often in Negroes than in other racial groups, although there is no proof that Negroes (or any other dark-skinned peoples) are any more susceptible to vitiligo than are Caucasians.

In the first patient, the gingival tissues were affected with a moderate degree of gingival pigmentation which was light brown. Histologic sections of the moderately pigmented gingiva showed the deeply staining melanoblasts in the basal layer of the epithelium. The depigmentation process stopped at the external angle of the month.

In the second patient there was complete clinical depigmentation of all oral tissues. In the third patient, a 59 year old man, the depigmentation had spread over the entire body; the mouth was edentulous with pink, firm ridges; there were two purplish-blue spots on the ridge of the lower left quadrant.

Studies of the oral phases of vitiligo should accompany research on dermatologic and systemic aspects. The absence or decrease of oral pigmentation is as important a factor as the presence or increase of melanin.

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Dental signs of hepatopathies

Editorial. *An.espań.odontoestomat.* 18:498-499 June 1959

The most important dental signs of hepatopathies are Vincent's and Teti's signs. Vincent's sign consists of the appearance of cuneiform erosions in the necks of the teeth of adults and it is a constant sign of all diseases of the liver. Teti's sign consists of the appearance of small erosions on the external surfaces of molars and bicuspids, immediately below the neck. The erosions are shallow and of a dark hue, mainly at the bottom. They are painless but if touched, a moderate hyperesthesia and even pain are elicited. This sign appears early in the course of many but not all liver diseases. When it appears it is characteristic and of pathognomonic value. This typical lesion should be clearly differentiated from the simple chromatic changes at the neck of teeth in periodontal diseases. It appears always in diseases of the liver which develop in association with biliary disorders of any type, causing an increase of the amount of biliary substances in either the blood, the plasma or both.

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Physics

Use of photography for photoelastic stress analysis of masticatory pressure exerted on restorations

E. S. Priester. *Deut.Zahnärztebl.* 13:652-656 Oct. 22, 1959

The steel and construction industries as well as several others have made use of a specific optical method—photoelastic stress analysis—to evaluate stresses and their effects on a wide variety of materials, products and structures under working loads.

Recently, a modified method of photoelastic stress analysis has been adopted in medical research for plotting the stress trajectories in human bones (mainly in femurs).

Success of this method depends on the properties of light and on the characteristics of certain transparent materials such as plastics under varying stress conditions.

H. H. Hollinger (1958) has developed a photoelastic stress analysis method applicable to dental practice. Human teeth, healthy or restored, represent complex components undergoing biting and chewing stresses. For example, Class II restorations develop strong internal stresses under load conditions. The use of photoelastic stress analysis can yield qualitative information about the points of likely stress, thereby indicating the need for changes in the design.

Ordinary (unpolarized) light may be characterized as having waves undulating in all directions perpendicular to the centric beam; simple polarized light consists of waves vibrating in one plane only. Certain materials known as polarizers have the property of transmitting polarized light in a definite plane in regard to the polarizer. The phenomenon of double refraction is also utilized. Certain crystals and transparent plastics under suitable conditions have the ability to divide incident light rays into two beams polarized at right angles to each other, one beam being slower than the other. The plastic does not show double refraction and does not exhibit the property of birefringence until it is under stress.

Stress analysis can be made of a restoration on a two-dimensional basis, usually in a vertical plane. Analyzing a restoration on a three-dimensional basis would be impractical in dental practice because of the resulting confusion of stress lines and would produce difficult photographic problems.

A routinely filled lower second bicuspid was selected to illustrate the effectiveness of photoelastic stress analysis. A scale model of a vertical section adopting the average lateral dimensions of the tooth was made from a 2 inch square (⅛ inch thick) of a suitable plastic, either "Enduron" or "Catalin." To this square, which is strong enough to withstand stress from simple equipment, forces of from 160 to 240 pounds were applied.

Plane-polarized light was directed to the model posteriorly. The effect was analyzed through an anteriorly used filter, the analyzer. Under stress, certain lines appeared which were perpendicular to the exerted stress. If monochromatic light was used, these isochromatic lines were colored but were crossed by certain additional black, isoclinic lines, parallel to the exerted stress. The isochromatic lines which appeared in the loaded specimen indicate the nature of stress distribution.

By use of photoelastic stress analysis, the characteristics of a restoration can be evaluated. An even distribution and broadening of the stress lines result when the angle between the axial and pulpal walls has been eliminated by preparing a curved surface. Theoretically, such a restoration is the strongest, especially suitable for the shape of the inner surface of a Class II restoration in a lower bicuspid. An analysis will reveal that this shape is almost entirely free of stress concentration.

Although Hollinger's method has been tested only in plastic materials, it can be used in evaluating the distribution and effects of stresses in healthy and restored human teeth.

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Physiology

Some observations on salivary secretion and fluid absorption by mouth

K. C. McKeown and G. H. Dunstone. *Brit.M.J.* No. 5153:670-672 Oct. 10, 1959

Measurement of normal salivary secretion is a difficult matter, and is subject to many pitfalls.

A 47 year old woman underwent an operation in which the entire thoracic esophagus was excised, the cardiac orifice closed, and a gastrostomy established. The cervical esophagus was exposed on the left side of the neck and delivered so as to establish a complete esophageal fistula just below the medial end of the clavicle. An adhesive ileostomy bag was fitted over the opening of the severed end of the esophagus so that all salivary secretion, together with any fluids taken by mouth, could be collected and measured accurately.

During the first and second postoperative days the total output of saliva was 45 ml. and 60 ml., respectively. This low output was attributed partly to dehydration and partly to preoperative medication and postoperative sedation. On the third postoperative day, the volume of secretion rose steeply to 450 ml. and thereafter fell gradually to a level of 120 ml. during the sixth postoperative day. On different occasions during the next ten days, while the patient was being fed through the artificial gastric fistula, various fluids were given by mouth, and the effect of these on the salivary output recorded. The giving of orange squash, milk or even water stimulated salivary secretion, but lemon drinks provided the most noticeable response, the volume of saliva secreted reaching a level of 545 ml. in 24 hours. On the days when water was given, the volume of secretion varied between 85 and 120 ml., the average daily secretion for these days being 110 ml.

A 72 year old man underwent an identical operation, and saliva specimens were collected exactly as in the first patient. During the first eight postoperative days the patient was instructed to take sips of water by mouth as and when he felt inclined, and his fluid intake was measured. In addition, he was given glucose saline intravenously. In the first two postoperative days 140 and 120 ml. less fluid was obtained from the esophageal fistula than the patient had taken by mouth. A similar deficit occurred on the fifth day, and on only three occasions during the first eight postoperative days was more fluid obtained from the fistula than was taken by mouth. From the eighth to the nineteenth postoperative day he was given sips of water amounting to 600 ml. a day; only on one occasion was more fluid obtained from the fistula than was given by mouth. On all other days a deficit was apparent, varying from 10 to 290 ml. During this entire period of observation the patient continued to be in a state of dehydration.

The establishment of a complete artificial cervical esophageal fistula ensured that no salivary secretion was lost, and obviated the criticism directed at other methods of collection in which saliva may be swallowed accidentally. No apparatus was present in the mouth, so that unwanted mechanical stimulation of the oral cavity did not occur, and there was no loss of salivary secretion by evaporation as the result of mouth breathing.

Best and Taylor (1955) reported that normal salivary secretion ranges between 1,000 and 1,500 ml. in 24 hours. Spealman (1943) indicated that the estimated resting secretion ranges between 220 and 838 ml. a day. Wainwright (1939) estimated that the active secretion can vary from 408 to 4,560 ml. a day. It would appear that previous estimations of the volume of salivary secretion have been too high, probably because of the method of collection of the specimens.

A search of the literature failed to produce any work on fluid absorption from the mouth. The findings from the second patient suggest that fluid was absorbed from the mouth or the cervical esophagus. The volume of fluid retrieved from a perfectly sealed esophageal fistula on most days was less than the volume of fluid swallowed by the patient, the deficit varying from 10 to 290 ml. a day. A fluid deficit was noted on 12 of the 19

days; the only explanation can be that fluid was absorbed from the mouth or the cervical esophagus in this dehydrated patient.

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The unique dentition of the European mammoth

E. Heinrich. *Deut.Zahnärztebl.* 13:373-374 June 8, 1959

Remains of the prehistoric European mammoth, *Mammuthus primigenius*, previously were found only in the arctic regions with an extremely cold climate and in an environment characteristic of the Pleistocene period. These mammoth relics consist of isolated skull fragments and tusks which in form and size resemble those of the Indian elephant, *Elephas maximus*.

Recently, remains of an extremely large species of the European mammoth were found in the valley of the Manzanares river, near Madrid, Spain. These remains reveal the unique characteristics of the mammoth dentition.

These prehistoric animals possessed a comparatively short but high and pointed skull which supported gigantic tusks with an unusual curvature. These tusks, found only in the skulls of old male mammoths, reached a length of more than 12 feet and showed a spiral form unequalled in species of extinct and recent elephants. The roots diverged from one another and the tips pointed toward each other. The middle part of the tusks was turned upward and outward.

The molars showed diversiform characteristics, being far shorter but wider than those of other elephant species. The second molars had from 14 to 16 lamellated layers, and the third molars from 18 to 27 of such layers. The lamellae ran crosswise. It can be assumed then in its dentition the European mammoth represented the highest point in the evolution of the elephants.

The recently discovered remains of the European mammoth, however, do not represent the first evidence for the existence of these prehistoric animals in the southern parts of Europe. Mammoths were hunted by Paleolithic man about 100,000 years ago. He left drawings of these animals on the walls of several caves in southern France. From these drawings it became apparent that the mammoth, unlike elephants, was covered with hair so long that it almost reached the ground. The accuracy of the drawings has now been confirmed by the evidence afforded by the remains found in Spain.

In mouths of some of the mammoths traces of food were found, consisting mainly of extinct species of grass, sedge, thyme, poppy and crawfoot.

It is not known when the mammoth became extinct. When the interglacial periods appeared, the mammoth probably was forced to migrate from southern Europe to the north, following the retreating ice fields and glaciers. In Siberia, however, mammoths may have survived to a much more recent period.

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The fossil skull from Olduwai

Brit.M.J. No. 5150:487 Sept. 19, 1959

News comes from the Fourth Pan-African Congress of Prehistory at Leopoldville that L.S.B. Leakey, curator of the Coryndon Museum at Nairobi, and his wife, have found a further ancient hominid skull at Olduwai, Tanganyika. This specimen was found in clear association with implements of the very primitive Oodowan culture, and with the remains of animals that probably formed part of the creature's diet.

From information so far available, it appears that the creature had a cranial capacity of about 600 cc. or perhaps rather more; the canines are small and not sharply pointed, the incisors are

disproportionately small in comparison with the large molars and premolars, and there is pronounced reduction and recession of the incisor region; the dental arch approaches a horseshoe shape and the alveolar margin is well-rounded; the mastoid processes and zygomatic region are of hominid conformation.

Leakey claims that the creature is a link between the *Australopithecinae* and more advanced forms of man, and as such is proposing to assign it distinct generic status. Yet the anatomical characters which may be perceived from the published photograph indicate that it is in all likelihood an *Australopithecus,* probably of the Paranthropus group. The fossil is of great interest on two main counts. It substantiates the hypothesis that the *Australopithecinae* were widely distributed in Africa in the early to middle Pleistocene and were not a local group evolving in comparative isolation in the southern part of the continent. It was established that *Australopithecus* was a tool-making creature. It thus becomes clear that toolmaking antedated brain enlargement in the course of the prehuman evolution.

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Bacteriology

Human parotid saliva as a sole source of nutrient for microorganisms

N. B. Williams and D. O. Powlen. *Arch.Oral Biol.* 1:48-61 Aug. 1959

Parotid saliva, collected under aseptic conditions from human subjects, was studied as the sole source of nutrients for strains of *Aerobacter cloacae, Bacillus subtilis* var. *niger, Candida albicans, Corynebacterium diphtheriae,* a species of *Lactobacillus, Staphylococcus pyogenes* var. *aureus, Streptococcus faecalis, Str. pyogenes,* and alpha hemolytic streptococci.

The populations of staphylococci, enterococci, *Aerobacter,* yeasts, and spores and vegetative cells of *B. subtilis* and *B. cereus* tended to survive and multiply suboptimally in the parotid saliva. Unfavorable effects of the reduced hydrogen ion concentration of collected parotid saliva on the staphylococci, enterococci and *Aerobacter* were less when the pH was adjusted with phosphate buffer. Germination of spores, multiplication of vegetative cells and sporulation of bacilli occurred in parotid saliva of 13 of 15 subjects. Saliva from eight subjects delayed germination, multiplication or sporulation for from 24 to 96 hours of incubation.

The populations of the lactobacillus, beta streptococcus, alpha hemolytic streptococcus and diphtheria bacillus tended to be unable to survive and multiply even though the pH of the saliva was altered by the addition of a phosphate buffer.

Differences between the effects of the saliva samples on bacteria also were noted with the strain of *Aerobacter* and *Lactobacillus;* otherwise, parotid saliva from several human subjects had similar effects on microbial growth.

These and further studies may lead to a better understanding and perhaps control of postoperative parotitis. Although microbes may gain access to the glands hematogenously, the findings reported here indicate that if microbes gain access through Stensen's duct, several kinds could metabolize in the static fluid, initiating an ascending infection. The reduction in flow rate may occur from the use of drugs prior to surgery or from the patient's response to the anesthetic or to surgery.

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Report on fluoridation in the United States

Pub.Health Rep. 74:513-516 June 1959

Dental decay is recognized as man's most widespread chronic disease. Few persons escape. No social stratum or age group is immune. A decayed tooth never heals by itself. About 97,000,000 people in the United States have decayed teeth requiring treatment; more than 21,000,000 others are edentulous; the average high school graduate has had ten teeth attacked, and family dental bills total $1.7 billion annually although only 40 per cent of those persons in need of dental care get treatment. This serious health problem remains largely neglected because of the undramatic nature of the disease, cost of treatment, the widespread tendency not to regard dental decay as a hazard, and insufficient professional manpower to provide care. This combination of factors points to the need for a preventive measure that is effective, safe, inexpensive, convenient, widely acceptable and automatic. The fluoridation of community water supplies meets these requirements.

In light of the evidence that no undesirable effects accompanied the dental benefits derived from water supplies naturally containing 1 ppm fluoride, three controlled fluoridation programs were begun independently in 1945 to determine whether these benefits could be duplicated by controlled fluoridation. The results of these and other studies were remarkably uniform and demonstrated that the use of drinking water containing 1 ppm fluoride: (1) produces identical dental and general effects whether the fluoride occurs naturally or is added by mechanical means; (2) acts effectively, safely and economically in preventing up to 65 per cent of tooth decay, and (3) does not produce observable mottling of the teeth.

Since the Public Health Service endorsed fluoridation in 1951, many communities have instituted fluoridation programs. In this country fluoridation is approved by every major scientific and professional organization having competence in the field.

Today more than 42,000,000 people in the United States (or about one in every three persons provided water by community water supplies) are drinking water containing the minimum or higher level of fluoride recommended. Of these, 35,000,000 in 1,778 communities are supplied water in which the fluoride level is controlled, and 7,000,000 in 1,903 places use water naturally containing 0.7 ppm or more fluoride. Fluoridation programs also are in operation in 20 foreign countries. The costs of fluoridation vary according to the amount and kind of compound required, but the average cost is ten cents a year per person. A device developed by Public Health Service engineers now enables communities to use fluorspar, further reducing the costs by two-thirds.

Most of the gains in fluoridation have been made in the larger cities; 66 per cent of the nation's cities with populations of more than 500,000, and 32 per cent of the cities with populations of between 10,000 and 500,000, have fluoridation programs. By contrast, only 17 per cent of those communities having populations of 2,500 to 10,000 and 5 per cent of communities with populations of less than 2,500 have such programs. Most of the people benefiting from this measure live in the larger cities.

Four different groups oppose fluoridation: those who oppose it in principle; those in whom the measure arouses personal anxieties; those who seek to acquire status, political or personal gain by opposition, and those who are uninformed. Opponents carry on nationwide campaigns through their two national organizations in the United States.

Several factors contribute to the problem. Tooth decay is not a dramatic, infectious, crippling or killing disease. The scientific arguments for fluoridation are not simple. The benefits to be derived from fluoridation cannot be observed for more than a decade—even then they are not obvious.

The crux of the problem is that a relatively few people are blocking the progress of an approved health measure. By so doing they are withholding health benefits from a large portion of the population, especially children, and are perpetuating a disease that seriously impairs the nation's health,

manpower and economic resources. If dental decay were a direct cause of death, there would be little doubt of the widespread adoption of water fluoridation.

Public Health Service, Washington 25, D.C.

Fluoride application to teeth

J.A.M.A. 171:375-376 Sept. 19, 1959

Q.—Please advise mechanism of action of topical application of fluorides on tooth surfaces in reducing dental caries. Current literature seems to be contradictory and confusing.

A.—According to the American Dental Association, use of fluoride preparations, topically applied, is based on the assumption that the fluoride will react chemically with the tooth to produce less soluble enamel. Therefore, a longer period of time or a larger amount of acid would be required to decalcify the tooth (Volker, 1939). Clinical studies have indicated that in a group of children topical application of fluoride solutions reduces the incidence of new carious lesions by as much as 40 per cent (Syrrist and Karlsen, 1954; Sundvall-Hagland, 1955).

Excellent articles on the significance of topically applied fluoride are available in published symposiums of the American Association for the Advancement of Science (*Fluorine and Dental Health*, 1942; *Dental Caries and Fluorine*, 1946; *Fluoridation as a Public Health Measure*, 1954). Several of these references discuss possible mechanisms of action. No specific mechanism can be agreed on at the present time; the finding has been more or less empirical.

535 North Dearborn Street, Chicago 10, Ill.

Observations on the effect of topical sodium fluoride on caries incidence in children

Robert Harris. *Austral.D.J.* 4:257-260 Aug. 1959

In 1952 a study was undertaken to observe the results of a minimum of five annual series of treatments with topical sodium fluoride to the teeth of children attending the Department of Preventive Dentistry, United Dental Hospital, Sydney.

At the time of the initial examination, the children ranged in age from 6 to 11 years; all were born and had lived in Sydney, the water supply of which is free of fluoride. After prophylaxis, an aqueous 2 per cent sodium fluoride solution was applied to the isolated and dried teeth by means of a cotton-wool applicator. Cotton rolls and a saliva ejector were used to prevent dilution of the solution from saliva. The lower jaw was treated in two quadrants, the upper jaw as one unit. The sodium fluoride solution was kept flooded over the crowns of all teeth for three minutes. The treatment was repeated four times at intervals of one week or less. Every child was given instruction in oral hygiene. The topical sodium fluoride treatments were repeated annually.

Of the children who were six years old at the beginning of the study, 126 were available for the final examination after five years, including 69 children used as a control group. At the beginning of the five-year period, the 69 children in the control group had an average of 2.03 DMF teeth; the 57 children in the treated group had an average of 2.05 DMF teeth. At the final examination when the children were 11 years old, the control group had an average of 8.37 DMF teeth, the treated group an average of 5.58 DMF teeth, or a reduction in incidence of 2.79 DMF teeth per child. This is a reduction in caries incidence of 33.4 per cent in the treated group.

It required about 31 hours to achieve the reduction which involved about 160 affected teeth. If it is assumed that the treatment of each affected tooth would require 30 minutes, a reduction in chairside time of 49 hours would have been achieved.

Reductions in the incidence of caries also were obtained in children who were older than six years at the time of the initial examination. The range for the children of various ages at the final examinations was 5.58 to 12.66 DMF teeth, compared with a range of 6.98 to 13.91 DMF teeth for the (untreated) state school children.

A final examination of as many children as possible will be made in 1962 and the results compared with the present achievement, and with the pattern of caries in the untreated control group of children.

United Dental Hospital, 2 Chalmers Street, Sydney, Australia

The incidence of first permanent molar loss in Western Australian children

Spyros E. Halikis. *Austral.D.J.* 4:201-206 June 1959

A study of the loss of permanent teeth in 3,731 children ranging in age from 6 to 14 years, who attended the Gustafson Dental Clinic, Fremantle, Western Australia between the years 1952 and 1958 inclusive, has been made. The 3,731 children consisted of 1,819 boys and 1,912 girls.

The 1,819 boys had lost the following number of permanent first molars: upper right, 270; upper left, 275; lower right, 356, and lower left, 377, for a total of 1,278. The 1,912 girls had lost the following number of permanent first molars: upper right, 320; upper left, 313; lower right, 460, and lower left, 434, for a total of 1,527.

It was not possible to demonstrate any significant difference between the right and left sides of the mouth for either sex. The loss of mandibular teeth for each age group in both sexes was consistently higher than the loss of maxillary teeth.

In the 3,731 subjects studied, there was a loss of 75.1 permanent first molars for every 100 children under the age of 15 years, and a loss of 36.1 other permanent teeth for every 100 children under the age of 15 years.

The tooth loss in most age groups was higher for the girls than for the boys. The loss of nearly 11 teeth for every 100 children at the age of six years—within 6 to 12 months from the time of eruption—is appalling. The period of greatest caries activity appears to be before the age of 13 years, and the greatest damage to the permanent first molars is inflicted before or about the time of puberty.

Of the 3,608 permanent teeth lost between the ages of 6 and 14 years, 2,805 teeth, or 77.7 per cent, were permanent first molars. Of the 3,005 permanent teeth lost between the ages of 9 and 14 years, 2,202, or 73.3 per cent, were permanent first molars. By the age of 14 years every 100 children had lost 126 permanent teeth.

Of the 803 permanent teeth other than first molars that were extracted, the largest number consisted of bicuspids, with an average loss of 13.1 teeth per 100 children. The maxillary incisors were a close second, with 12.1 teeth lost per 100 children.

At the age of nine years, every 100 children had lost 1.8 maxillary incisors; at the age of 12 years, they had lost 16.6 maxillary incisors.

6 Hale Street, North Beach, Western Australia

Sex differences in the prevalence of dental caries

J. N. Mansbridge. *Brit.D.J.* 106:303-308 May 5, 1959

The literature is almost unanimous in showing the female to have a greater number of DMF permanent teeth than the male at the same age. The greater prevalence of dental caries in the female has been attributed to the fact that, on the average, the permanent teeth erupt earlier in girls than in boys. On the other hand, Sloman (1941) considered that the differences in age of eruption of the permanent teeth between the sexes were insufficient to explain the greater dental caries experience in girls, and postulated that, if the dental caries rates were equal in both sexes, the differences in time of eruption of the permanent teeth would require to be greater than in fact they are.

A study was made to examine the differences in dental caries prevalence between the sexes with particular reference to their level of dental development, to determine whether the observed differences between boys and girls of the same age merely reflected differences in rate of dental development or whether they were more likely to be due to constitutional (that is, genetic) factors.

The prevalence of dental caries and the time of eruption of the permanent teeth were studied in 4,034 Edinburgh school children 5 to 17 years old. The DMF rate was consistently higher in girls than in boys for the whole age range studied. When the children were grouped according to the number of teeth erupted, a better approximation to development age was achieved, but the difference between the sexes in terms of dental caries experience was still evident, which lends further support to the view that this difference probably is due to causes other than inequalities in time of eruption. The higher prevalence of caries in girls occurred in spite of a generally higher standard of oral hygiene in girls.

The facts presented in this study do not sup-

port the view that sex differences in caries are explained by the earlier eruption of permanent teeth in girls. The facts support the findings of Sloman. It is concluded that part of the difference in caries prevalence between the sexes is constitutional in origin.

Department of Public Health and Social Medicine, University of Edinburgh, Edinburgh, Scotland

Experimentally produced dental caries in Syrian golden hamsters

V. Doktorov. *Ceskoslov. stomat.* 59:181-182 May 1959

An experimental animal which is readily susceptible to dental caries has long been recognized to be the prerequisite for research on cause and control of dental caries. In recent years, the Syrian golden hamster, *Cricetus auratus*, has become increasingly useful as an experimental animal. Previously the albino rat had been used extensively for dental research; it has not been satisfactory because certain features of its dentition are not analogous to the human dentition. Although the incisors of the Syrian hamster resemble those of the albino rat, the molars are smaller and have a different coronal pattern. The hamster's cusps are completely covered by enamel at the time of eruption, whereas the rat's cusps are formed with areas free of enamel on their tips.

In the present investigation the types of carious lesions occurring in the molars of Syrian hamsters and the methods of production of these lesions are presented. The high susceptibility of the molars of hamsters fed a cariogenic diet consisting mainly of barley, coarse and fine dextrin and sucrose was found to be in great contrast to the comparatively high resistance of the molars of the control animals fed a normal diet. The topographic structure of the hamster molars probably plays a significant part in the development of experimentally produced caries, although the optimal experimental period of 14 weeks proved to be too short to permit the results obtained to be rechecked sufficiently to provide a thorough study of the cause of caries or its prevention.

The preliminary studies of caries in Syrian golden hamsters indicate that the experimentally produced carious lesions are grossly and microscopically comparable to those in man. Unlike caries produced under similar laboratory conditions in the rat, the lesions in the hamster were widely distributed in both the upper and lower molars and developed without evidence of fracture.

Compared with clinical studies of the incidence of caries in the molars of children, the results obtained with hamsters demonstrated that in both man and animal etiologic as well as predisposing factors are active in the development of caries. Knowledge of this tendency is important in the diagnosis, prognosis and treatment of carious lesions.

State Sanatorium, Bratislava, Czechoslovakia

Effect of natural fluorides on caries incidence in three Georgia cities

Fred D. Lewis, Jr., and Ernest C. Leatherwood. *Pub. Health Rep.* 74:127-131 Feb. 1959

A dental survey of 9,301 white school children between the ages of 6 to 15 years was conducted in the cities of Macon, Savannah and Moultrie, Ga., to determine the effect of different concentrations of natural fluorine in the water systems on the rate of dental decay. All the children examined were continuous residents who had used only the public water supply since birth.

The natural fluorine concentration was about 0.11 ppm in Macon, 0.38 ppm in Savannah, and 0.75 ppm in Moultrie. The mean maximum annual temperatures for these cities were 77.6° F., 76.6° F., and 80.0° F., respectively.

On a percentage basis, Moultrie had about twice as many caries-free children as Savannah, and more than two and a half times as many as Macon.

The DMF rate per child was 4.64 in Macon, 2.99 in Savannah, and 1.82 in Moultrie. Moultrie's DMF rate was 60.8 per cent lower than Macon's and 39.1 per cent lower than Savannah's; Savannah's was 35.6 per cent lower than Macon's.

The decayed-filled rates for deciduous teeth were slightly lower in Moultrie than in the other two communities.

Savannah, with a natural fluorine content of about 0.38 ppm in the water system, is providing

its children with 35.6 per cent protection against dental decay. An additional 39.1 per cent reduction in caries would be expected if Savannah were to increase the fluoride concentration to equal Moultrie's 0.75 ppm. Macon, with only a trace of fluorine in its water system, would expect to reduce dental caries in its children by at least 60.8 per cent with adequate fluoridation.

Dental Health Service, Georgia Department of Public Health, Atlanta, Ga.

Evaluation of caries-preventive procedures

L. J. Baume. *J.dent.Belge* 50:153-162
May-June 1959

Statistical technics designed to evaluate objectively the effectiveness of caries-preventive procedures should, according to the Team on Standardization of Caries Statistics of the ORCA, include the following indexes:

1. The DMF index, which appears qualified for an estimate or better approximate appraisal of past and present caries experience (prevalence) of a population of some magnitude. Estimates of the caries incidence within smaller groups of the population may be expressed by the DMF surface rate per person.

2. The cavity index, based on the incidence rate of new carious lesions appearing within a definite time period, is the only objective device in expressing statistically the activity of caries.

3. The design of caries investigations, the selection of adequate examination methods, the determination of the periodicity and duration of a caries attack, the accumulation and computation of the sample size required and the data obtained, as well as the presentation of the results and conclusions should be standardized to such an extent as to eliminate a maximum of procedural errors.

Successful clinical evaluation of the usefulness of caries-preventive procedures rests partly on the familiarity of the researcher with appropriate statistical procedures and partly on his intimate understanding of dental data. Creation and universal application of standardized technics should be helpful as a guide to dentists who are planning to conduct surveys on dental caries, and should aid them to make their research designs in a more systematic manner as well as to present their results with more accuracy and confidence.

In collaboration with over 70 experts in the field of dental research, nine revisions of "Proposals of an International Standardization of Dental Caries Recording Methods" were published by the ORCA committee, in English, French and German.

The cornerstone of this growing scientific edifice was set by the historical field studies of Dean and Arnold in demonstrating the fluoride-caries inhibition relationship as well as in the use of the DMF index for evaluating caries-preventive procedures.

Caries researchers should always be aware of the truth in Mark Twain's words: "There is something fascinating about statistics. One gets such wholesale returns of conjectures out of such trifling investments of facts."

Department of Operative Dentistry and Dental Pathology, University of Geneva, Switzerland

Public health education in England

K. Quecke. *München.med.Wschr.* 101:120-123
Jan. 16, 1959

In England, the development of public health education and of public health services, within the framework of "socialized" medicine and dentistry, has a rather short history, but it received the most significant impetus after World War II.

The National Council for Health Education held a postgraduate course on public health education in Chichester, Sussex, from August 19 to 29, 1958, which was attended by many dentists, physicians, educators, nurses and some parents. Among the subjects covered were the formation of small discussion groups (from 6 to 20 participants), panel discussion groups (from 20 to 100 participants) and large discussion meetings (from 100 to 500 participants) within given communities. The programs recommended for public discussion by such groups included the prevention, early diagnosis and treatment of the diseases and conditions most prevalent in England, including dental caries, periodontal disease, cleft lip and palate, and neoplasms of the maxillofacial region.

Advocated as expedients to arouse public inter-

est were television, radio, leaflets, posters, brochures and scientific displays. It was also pointed out how the press in England, especially women's magazines, plays an important part in influencing opinions on public health problems.

It is necessary that immediate steps be taken nationally to educate the public in matters of positive health procedures and to improve the facilities available for the treatment of infants, children and adolescents. The effect of socialized dentistry and medicine on the structure and status of the dental and medical professions in England causes grave anxiety in those professions, and only the next ten years, despite public health education, can show whether the present disparity between the public demand for treatment and the lack of dental and medical manpower will prevent adequate public health care through the existing health insurance system.

Kreisgesundheitsamt Giessen, Grosseelheimerstrasse 17, Marburg/Lahn, Germany

The role of oral diagnosis in periodic health appraisal examinations

H. D. Millard and C. J. Tupper. *Oral Surg., Oral Med. & Oral Path.* 12:1273-1278 Oct. 1959

A program to provide an extensive periodic health appraisal for the faculty was instituted at the University of Michigan in July 1956. The appraisal consists of a history and physical examination, laboratory slides, and roentgenographic studies (including films of the chest, gastrointestinal tract and mouth). The program is entirely diagnostic. Reports are sent to the patient's physician and dentist. From the outset, it was agreed that the examination should include a careful dental appraisal. This program is believed to be the only one in the country which includes a thorough examination of the oral cavity.

In the first year of the program 294 professors, ranging in age from 43 to 87 years, were examined. All were professional persons, most were men, and most were between 50 and 60 years old. Four hundred and sixty-five instances of disease or defects in general health not previously recognized were found; of these, 245 were of such importance as to warrant immediate attention.

The number of dental examinations completed in the first year was 261. Of the group examined, 158 made regular visits to their dentists for prophylaxis and examination at intervals of 6 or 12 months; 86 made such visits at regular intervals of more than one year. Seventeen admitted neglect to oral health.

The finding that only 4 of the 261 persons wore both upper and lower complete dentures indicated that dental patients who seek and receive regular dental care benefit by retaining natural teeth into advanced age.

In 208 of the 261 patients there was minor to moderate need of restoration of teeth; in 22, advanced dental caries was present but in 27 persons, there were no cavities.

With respect to periodontal disease, the findings were as follows: acute necrotizing ulcerative gingivitis, 1 person; chronic necrotizing ulcerative gingivitis, 10; incipient periodontitis, 17; moderate periodontitis, 54, and advanced periodontitis, 33. In addition, 31 persons exhibited some localized areas of simple gingivitis.

With respect to the oral mucosa, the findings were as follows: solar or senile cheilosis with hyperkeratosis, 5 persons; smoker's patch on lip, 3; nicotine stomatitis produced by pipe smoking, 27; focal hyperkeratosis produced by mechanical irritants, 17, and fistula from apex of root to mucosal surface, 4.

Roentgenographic examinations of the mouth were completed for 241 persons and the findings were as follows: teeth with nonvital pulps, 27; periapical radiolucency, 36; retained tips of roots, 5; impactions, 11, and radicular cysts, 3.

No malignant neoplasms were found in the oral region.

With one exception, all of the group gave the name of their personal dentist to whom they wished a report of their examination sent. The dental findings indicate a need for greater emphasis on at least two areas of oral diagnosis: (1) recognition of periodontal disease in its early stages, and (2) more effective use of dental roentgenograms. A thorough examination at regular intervals can detect much unsuspected disease and contribute to the length of time that the natural teeth are retained.

School of Dentistry, University of Michigan, Ann Arbor, Mich.

Side effects of iodine preparations used in dental practice

M. Filipinsky. *Prakt.zubni lekař.* 7:35-47 March-Apr. 1959

Iodine compounds are used in dental practice as germicides and antiseptics. Although many dentists and oral surgeons consider iodine the best disinfectant for the oral mucosa and the facial skin, it frequently causes inflammatory reactions which outweigh its direct action on pathogenic microorganisms.

In sensitive patients, iodine, whether used as tincture or solution, may cause iodine acne or iodine gastritis. For the dentist it is important to know that iodine also may produce thyrotoxicosis, and the use of any iodine compound in endodontic treatment of patients sensitive to iodine is contraindicated. In dental literature, several case reports have appeared in which hyperthyroidism was described, obviously caused by the use of iodoform pastes in root canal or periodontal treatment.

Experiments with radioactive iodine used as part of root canal fillings have proved that traces of the element were demonstrable within 30 minutes in the blood serum as well as in the thyroid gland.

Povidone iodine solution (Betadine), however, shows a favorable antibacterial activity, and seems to be free from the side effects commonly observed after use of other iodine preparations. This solution, available as a clear, dark red liquid, is suitable for use on the oral mucosa, especially if applied at the site of an oral injection, because it reduces significantly the number of pathogenic bacteria.

In modern dentistry, however, most iodine preparations have been replaced by newer and more effective antibacterial agents.

Krakovská 8, Prague II, Czechoslovakia

Parotitis after diuretic therapy

Lawrence Power. *New England J.Med.* 260:1079 May 21, 1959

As recently as ten years ago, acute suppurative parotitis occurred generally as a complication either of an acute systemic infection or of the postoperative state—hence the name "surgical parotitis." The infection for the most part arises from a retrograde invasion of the parotid gland by oral bacteria; the most necessary prerequisite appears to consist of dehydration and a reduced flow of saliva from the gland. It is in the prevention of dehydration, particularly through attention to fluid and electrolyte balance, that modern management has been so successful.

Coexistent with this improvement, however, and as a result of advances in other fields, a form of infection of the parotid gland that may be termed "medical parotitis" has become discernible. It consists of an otherwise ordinary suppurative parotitis, but complicates the use of diuretic agents.

Five case reports illustrate the development. All five patients were receiving diuretics and all developed suppurative parotitis which responded in each instance to intramuscular injections of penicillin.

Leamington District Memorial Hospital, Kingsville, Ontario, Canada

Abuse of and dangers in treatment with antibiotics: clinical viewpoints

H. C. A. Lassen. *Nord.med.* 61:453-458 March 19, 1959

The most common mistakes in antibiotic treatment are: (1) attempts to decrease abnormally high temperature without proper diagnosis; (2) indiscriminate choice of the antibiotic agent; (3) inadequate dosage, resulting often in masked effects which make the exact diagnosis difficult; (4) overdosage and too-long continued antibiotic therapy, resulting in toxic effects; (5) application in treatment of infections not influenced by antibiotic agents; (6) inexpedient manner of administration; (7) failure to discontinue antibiotic therapy after occurrence of complications; (8) failure to change the treatment in spite of the

presence of mixed infection, and (9) application of antibiotic agents as preventive treatment (justified only in isolated instances).

Caution in the use of all antibiotic agents would undoubtedly result in reducing the present-day excessive application of antibiotics and sulfonamides, thereby lessening the dangers in treatment with these substances which, correctly applied, are among the most important drugs in the collective therapeutic armamentarium of medicine and dentistry.

Sturegatan 16, Stockholm 5, Sweden

The management of recurrent aphthous stomatitis

Wilfred Sircus. *Brit.M.J.* No. 5155:804-806 Oct. 24, 1959

Thirteen patients with severe recurrent aphthous ulceration of the mouth were subjected to a double blind trial to determine the value of antibiotics and steroids in management.

One month after an initial consultation and examination, each patient was given a sequence of treatment with lozenges of identical appearance and taste. These consisted of: (1) a dummy preparation with no active ingredients; (2) an antibiotic, framycetin sulfate, 10 mg., and (3) a combination of framycetin sulfate, 10 mg., and prednisolone, 1 mg. The sequence of administration of the different lozenges was distributed for each patient in random fashion, using a previously arranged plan. The patients remained 28 days on each preparation, allowing the lozenges to dissolve in the mouth slowly, six times daily. A diary of the date of onset and the progress of the mouth lesions was kept by each patient. After completion of the three-month double blind trial, most of the patients received 28 days of treatment with hydrocortisone hemisuccinate (2.5 mg.) lozenges, six times daily, and a further month on secobarbital sodium ¾ grain (50 mg.) twice daily. This part of the trial was open. The code of therapy for the double blind part of the trial was not opened until the six months of treatment had been completed.

The 13 patients consisted of 9 women and 4 men ranging in age from 28 to 60 years. Four patients were considered to have a stable social background and to have normal and fully adjusted personalities. One patient had partial mental defects, two showed moderate schizoid features, three had well-developed chronic tension states and three had moderate to severe mental or emotional depressions.

Three patients, all women, showed no response either to the consultation or to any form of treatment; two of these subjects were schizoid and the third was depressed. Three patients, including one man, responded only to steroids, the ulcers being absent from the mouth throughout the period of administration of the agent; the group had no common features of personality or social background. Four patients, two men and two women, responded equally well to every phase of the trial, including the period on placebo lozenges; three of the four had shown a "curative" response to the initial consultation. The remaining three patients improved after the consultation, but subsequently relapsed and did not respond to any form of therapy.

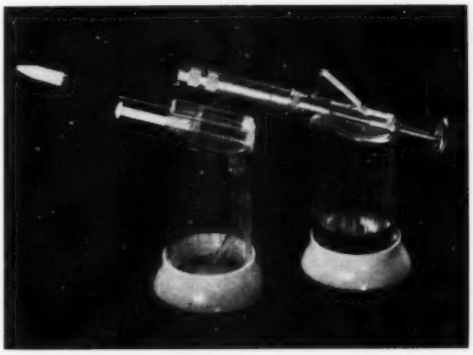
In the absence of any knowledge of the basic etiology of recurrent aphthous ulceration, management must remain empirical and be aimed at associated features which may be effecting continuity of the disease process. The interest of the practitioner, sedation and the resolving of social and emotional problems do more than any other procedures to effect control in those patients in whom chronic anxiety, tension, or depression of exogenous origin is evident. No such value has been shown in patients in whom the abnormal states of mind were endogenous.

Where neither exogenous stress nor endogenous abnormality is associated with the disease, steroid therapy remains the most useful of the procedures examined. Antibiotics are of no value in treatment.

Western General Hospital, Edinburgh, Scotland

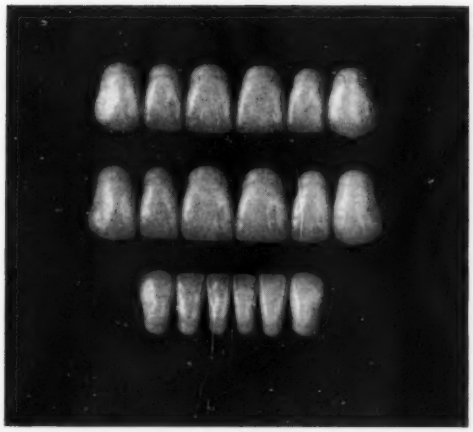
New equipment

The information reported here is obtained from manufacturers. Dental Abstracts *does not assume responsibility for the accuracy of the information. The interested reader may direct his inquiry to the manufacturer.*

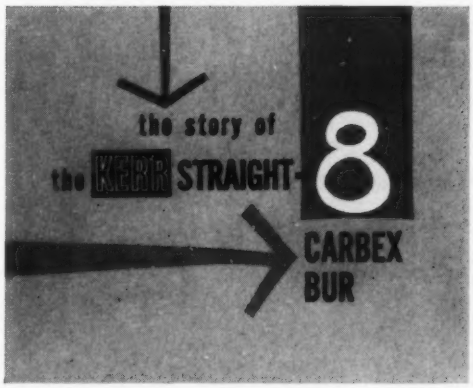


A new lubrication kit, of the type used by dentists for maintenance of dental and laboratory equipment, consists of a high-pressure pistol type oiler that dispenses drops or a steady, fine stream of oil, and a hand-sized grease gun which develops up to 3,000 psi. Both load easily, provide a visual supply, and can be operated with one hand. They are made of colored unbreakable plastic. *Cold Spring Products Co., Cold Springs, N.Y.*

Two bracket-mounted "Dentalair" units have been introduced. The "Junior" model provides both straight and contra-angle handpieces on a head which may be mounted on a conventional engine arm or operatory wall, cabinet or rolling pedestal. The Dentalair "Minor" model is fitted with a single contra-angle handpiece. *Atlas Copco, 610 Industrial Ave., Paramus, N.J.*



Three new "Dura-Blend" molds for anterior teeth and one new shade to supplement the existing 13 molds and three shades have been introduced. The two new square upper molds and a new lower mold feature slender forms and longer ridge laps to minimize grinding. A new M66 shade has color characteristics between those of the M61 and M65 shades. *Myerson Corp., 66-90 Hamilton St., Cambridge 39, Mass.*



A 50-frame color slide film depicting advantages of the "Straight Eight Carbex" bur is available. Viewing time is 25 minutes. *Kerr Mfg. Co., 6081 Twelfth St., Detroit 8, Mich.*

Doctoral and Masters' dissertations

In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.

The reactions of the subcutaneous connective tissue of Wistar rats to implanted dental cements. *John Benjamin Boyd, Jr. 1959.* M.S.D. *Indiana University.*

Threshold force value for anterior retraction. *Murray H. Groves, Jr. 1959.* M.S.D. *Indiana University.*

The effect of insulin on the healing of bone on wounds in albino rats. *Worth B. Gregory, Jr. 1959.* M.S.D. *Indiana University.*

An electromyographic appraisal of temporal and digastric muscle behavior under the influence of oblique loads. *Bernard M. Pawlowski. 1959.* M.S. *Loyola University (Chicago).*

Histogenesis of repair of the dental supporting tissues after mucogingival resection. *Malbern N. Wilderman. 1959.* M.S. *Loyola University (Chicago).*

Cytodiagnosis of oral lesions by fluorescence microscopy. *Charles W. Conroy. 1958.* M.S. *Ohio State University.*

The epithelial root sheath. *Franz W. Logan. 1959.* M.S. *Ohio State University.*

The influence of epinephrine on the incidence of bacteremia. *John D. Louis. 1959.* M.S. *Ohio State University.*

A radiographic cephalometric evaluation of the various methods of scribing the mandibular line as related to alterations in head position. *Robert L. Edgerton. 1959.* M.S.D. *Northwestern University.*

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